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The Journal
OF THE
Michigan State Medical Society

ISSUED MONTHLY UNDER THE DIRECTION OF THE COUNCIL

VOLUME XXIII. No. 5
WHOLE NUMBER 261

GRAND RAPIDS, MICH., MAY, 1924

YEARLY SUBSCRIPTION, $5.00; SINGLE COPY, 50c

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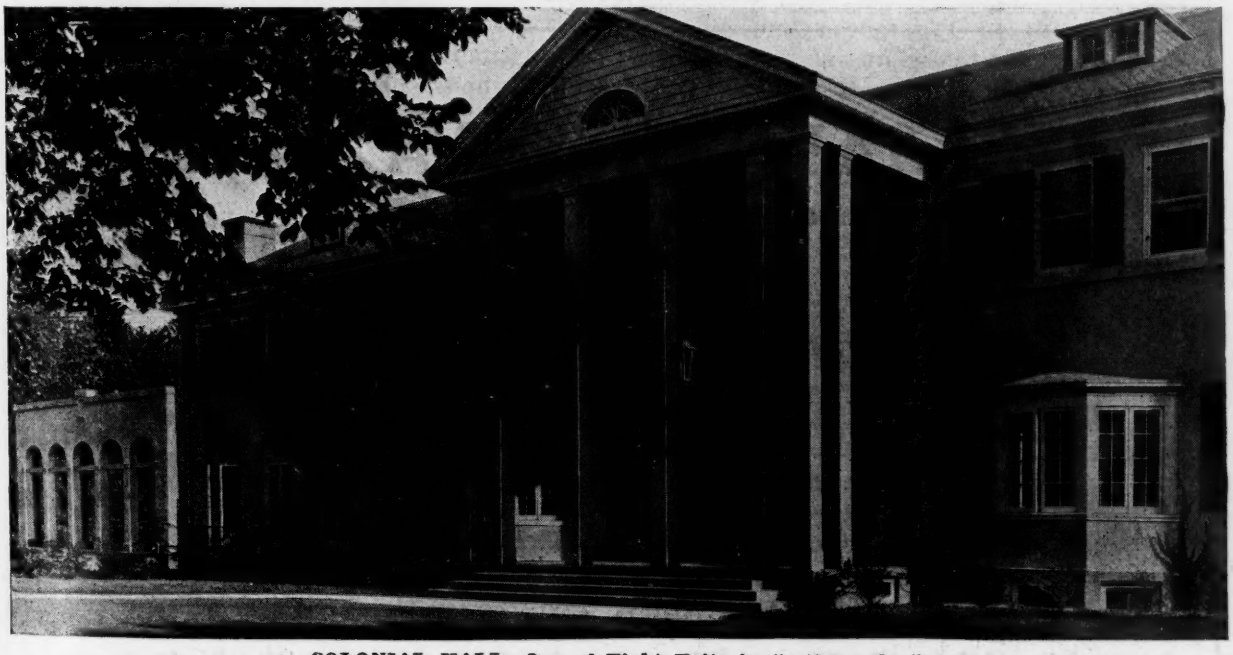
Office of Publication, Powers Theatre Building, Grand Rapids, Mich.

Entered as second-class matter March 12, 1913, at Grand Rapids, Mich., under the Act of March 3, 1879. Acceptance for special rate of postage made under Article 1103, October 3, 1917 and authorized August 7, 1918.



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Vol. XXIII. GRAND RAPIDS, MICHIGAN, MAY, 1924 No. 5

Original Articles

THE ESSENTIAL INTERDEPENDENCE OF MEDICINE AND NURSING

Presented at the Convention of Ontario Nurses at Windsor, Ont., April 24, 1924.

HUGH CABOT, M. D.
ANN ARBOR, MICH.

It is perhaps presumptuous in this day and age for any physician to undertake to discuss the problems of nursing with a group of experts in that field, but it is precisely because I vaguely sense a certain drawing apart of physicians and nurses that I am bold enough to take your time in discussing the relation of the two professions.

At the outset it is not unwise to remember that medicine is an exceedingly old profession and that it has had ample opportunity to encounter the problems inseparable from growth of knowledge and the changing organization of society. Thus many of the problems which arise in the development of a group whose only excuse for being is the care of the sick and the prevention of disease, have been met and dealt with in the past. It is also wise at this time to recall that nursing as an organized profession is very young, hardly more than half a century old, that it has had a very rapid, spectacular and well deserved growth, and that its problems are not entirely different from those which have come up for solution by the medical profession. For these reasons it appears to me that those who are vitally concerned with the development of nursing will be well advised to consider at the various turning points of their development whether or not similar questions have been faced by the medical profession, how they have been solved and whether in the light of developments the solutions have been sound.

The development of nursing has clearly been the result of the increasing complexity of the science of medicine. Too often it is thought of, and particularly by the laity, as simply a group of people whose chief business is making patients comfortable. This is undeniably an important function of nursing, but equally undeniably it is not its chief function. Its chief function, as I see it, is making the practice of medicine efficient. It is in fact a department of applied therapeutics, one in which the necessary principles are laid down by the physician, but in which the chief application of these principles is through members of the nursing profession.

It is, I think, generally admitted that the physician and the nurse in the care of disease are inseparable. Some of you may remember a line of our former friend, Mr. Dooley, who in discussing Christian Science spoke as follows: "You know, Hennessey if the doctors had a little more Christianity and the Scientists a little more science, it wouldn't make much difference which you had, if you got a good nurse." This voices the general acceptance of the view that nursing is today an essential part of the efficient practice of medicine. But this is not all. Just as the practice of medicine never stands still, so the practice of nursing cannot stand still. With the increasing development and increasing complexity of medicine there goes of necessity increasing complexity of nursing. In nursing as in medicine there is a clear tendency to the development of specialties, and one now sees many women who almost from the outset of their training have a clear plan to qualify themselves as experts in the field of nursing. Many positions in connection with hospitals call for experts in nursing. Public health nursing has become a very distinct specialty, and one might even point to the development of the industrial nurse as a growing specialty. All of this means, as I see it, an increasing interrelation between medicine and nursing, and lays upon those who would wisely guide the development of nursing education the requirement to survey widely the field, to see how the problems of nursing and the problems of medicine are similar or at least parallel, and to avoid some of the mistakes which have clearly been made in the rather haphazard development of medical education.

At this point I am inclined to call your attention to the fact that the interrelation is so close that there are many points at which it is not easy to say whether the nurse, in the proper execution of her duty, is not in fact engaged in the practice of medicine. Many of you have probably heard mutterings of this sort, and there are, I think, a considerable number of physicians who distinctly fear that the growth of the nursing profession will bring them into a territory regarded as staked oc by the profession of medicine. I must confess that it seems to me that these fears are largely groundless. There is no doubt that in the rapid growth and important change of the practice of medicine many of the things formerly done by the physician are now done by the nurse, wholly to the advantage of all concerned. It is quite impossible, as I see it, to draw a line at which the practice of nursing should stop and the practice of medicine begin. No such line is possible nor do I believe it to be desirable. The outstanding fact of the situation appears to me to be that in all these cases where there is doubt as to where the line should be drawn, the nurse is in fact acting as the agent of the physician. The situation is not unlike that of the surgeon who associates with himself numerous assistants, including an anesthetist. For all these people before the Law he is responsible. They are his agents. Any accident happening as the result of their ineptitudes are charged to him. He cannot divest himself of the responsibility, and it is unwise that he should do so. The public very properly wishes to be able to hold someone responsible and quite simply and properly looks to the physician upon whose general orders these people depend for their guidance. A similar line of reasoning may, I think, be applied to the situations in which it appears that the practice of nursing and the practice of medicine are likely to collide. It is unquestionably true that the interest of the public demands that nurses be not only allowed, but encouraged to do those things for which they are equipped. This will inevitably take them into the border lands of the practice of medicine, quite as I believe to the interest of the public.

If my major premise be true and the professions of nursing and medicine are inextricably intertwined in their development, it will necessarily follow that many of the problems of nursing education and medical education are the same, and I hope, as one profoundly concerned with medical education, that you will bear with me in some suggestions in regard to nursing education. It is quite clear, in fact beyond discussion, that those who are to assume responsibility in the community for the care and management of disease must have a reasonably sound preliminary education. With the present wide diffusion of educational possibilities it does not seem too much to require a secondary education of high school grade. The general rule that applicants for training in nursing schools should have a high school diploma is unquestionably sound. It would, I believe, be wise to leave some loop hole through which might slip occasional women of first class qualifications who, through some accident of fortune, had failed to finish their high school course. In the last quarter of a century there have come to me on several occasions, as have doubtless come to many of you, a number of women whose experience in the world and whose education, using the word in the broad sense, amply qualified them to take a nursing education and who yet lack some of the qualifications of a high school diploma. For these people some machinery should be constructed so that they might be adjudged to have qualifications equal to a high school diploma. The number will probably not be large, but it is my best guess that in this group some of the most outstanding nurses will ultimately be found.

There will be little disagreement with the general regulation that the course in nursing leading to a diploma and to permission to register as a trained nurse should cover about three years. It is perhaps true that by removing from the curriculum certain work not essential to a nurse's training the period may be somewhat curtailed. On the other hand, time is an element of first class importance in qualifying anyone for so intricate a business as the care and management of the sick. Mere contact with sick people is a most fundamental requirement, and it may fairly be doubted whether any very important diminution in this time requirement can be made.

At this point I desire to call to your attention to certain fundamental practices which have grown up in medical education and which are now causing medical educators the greatest concern. It is nearly a generation since the medical curriculum was profoundly altered by the introduction of what is knomn as the Concentration System, in which the fundamental subjects of Anatomy, Physiology, Bacteriology, Pathology, etc., were taught at the very beginning of the course and all contact with patients was pushed into the later years of the curriculum. This plan gave every evidence of

being a most promising and fruitful alteration, but, so fallible is human judgment, it has returned to mock us with the notorious insecurity of our own decision. To some extent there was overlooked in this system the now well known fact that theory and practice must go hand in hand. This whole Concentration System was based upon the assumption that theory should precede practice and as a result there was produced a medical curriculum which I frankly believe to be a pedagogical monstrosity. If there is one fact in education more certain than another, it is that the wide separation of theory from practice spells failure in the acquirement of knowledge. We remember those things which we use and we notoriously forget those things for which we cannot see the application.

It is, therefore, to be hoped that in the construction or alteration of the curriculum of nursing schools this pedagogical blunder in the teaching of medicine will not be perpetuated.

In my best judgement those parts of the fundamental sciences which must be known to the nurse, can be acquired most certainly and anchored most securely if taught in very intimate relation to the study of disease and the care of patients.

If we are prepared to admit, and the reasoning appears to me to go on all fours, that nursing is not simply the business of making people comfortable, but it is in fact the application of treatment to disease, then it follows that the education of the nurse must include a broad and fairly comprehensive knowledge of the manifestations of disease. It is no longer possible for us to pretend that a roundly educated nurse can be ignorant of the general facts of health and disease. It is possibly true that the amount of medical knowledge which it is necessary for a nurse to have at the present time will exceed the amount of knowledge which it was necessary for a physician to have a century ago (so far have we come in the development of the Science and Art of Medicine). If in three years she is to acquire a rounded knowledge of the manifestations of disease and of the principles of treatment, she must have most intimate contact with patients and be more or less constantly under instruction.

The fundamentals of this instruction can, I believe, be best given by the physician; the details best by those trained not only in the practice of nursing, but also in the practice of teaching. In the construction of an ideal staff for a nursing school the attempt must be made to secure scientists with knowledge of the fundamental sciences, physicians with knowledge of the every day manifestations of disease and nurses who have spent time in the care and management of the sick.

It may seem that I have taken no account of the education which must form the foundation for the developing specialties of nursing, but the apparent oversight was quite intentional. I entirely realize the importance of further education for those who are going beyond the stage of qualification for the care of the individual sick. I believe, however, that the training of executives, of teachers of nurses, of public health nurses and of industrial nurses should have as a foundation the normal three years' course in nursing. I cannot bring myself to believe that the best training for these advanced positions should be begun with a long and complicated study of the fundamental sciences. This appears to me to invite the same blunder which has been committed in medical education. The training for the nursing specialties should, I think, be a continuation of the training of the ordinary, sometimes called private duty nurse. Clearly the public health nurse and any of the many subdivisions of this group must know more of the great field of preventive medicine and know much of the relation of the Law and of organized society to disease. The industrial nurse must be thoroughly familiar with the intricacies of the compensation law to say nothing of the additional knowledge of the complications likely to ensue from the various industrial accidents. But this training, as it appears to me, should be what one might call post graduate work tacked onto the preliminary education which will have enabled these people to come to a decision as to the line for which they are properly suited. Training for many of these specialties will require two or even three years of additional work, but with the background which they will have already obtained I believe their education will progress more rapidly, more fruitfully and more securely.

I am not impressed with the plan at present in operation in some schools of nursing to require these women to decide at the very outset of their contact with nursing that they desire to follow, particularly some special line. This is not the way in which the human mind works, and decisions made in advance to follow certain special lines over a considerable period of years, are likely in many cases to turn out as faulty judgment.

There is one further question constantly

intruding itself in these discussions of nursing education, and this has relation to the possibility of developing a group of people less trained than the present trained nurse and yet available for the care of the sick. No one will deny the desirability of the development of such a group—a group often referred to as trained attendants—but the education of these people appears to me to be surrounded with the gravest difficulty. They must have some knowledge of the nature and cause of disease, but it is probably true that the less they know, the more they will think they know. Inevitably as time goes on they come to think of themselves as quite the equal of the registered nurse, demand equal consideration and compensation and in fact delude the public, if indeed they do not bite the hand that fed them. Time may bring some solution of this problem, but at the present time I incline to the view that the attempt to train attendants on a large scale will have as its chief effect the lowering of the standards of nursing obtained only with the gravest difficulties and will not in fact produce what we seek, namely: willing hands and humble minds. The solution, I think, must be sought in some other direction.

Finally I should like to call to your attention what seems to me certain signs of the time. We are all conscious of the fact that the doings of those who offer service to the community are at the present time under rather strict appraisal. Particularly is this true of those who are to any extent in the public service. For this reason those dealing officially with the problems of health and disease and who are allowed by the State through its Registration Boards to assume these responsibilities must be very sure of the nature and quality of the service which they are offering. It is essentially a time when all those who are concerned with the care of the people's health should be working together to a common end. There are folk aplenty who will attempt to discredit us and who will not hesitate to adopt any methods likely to be successful. Their efforts at the present time have been crowned with success to the point that they have succeeded in creating suspicion. That the suspicions are largely groundless is not a satisfactory answer. Only the clear evidence of performance, of unity of purpose and of a pervading spirit of service will prove convincing. It is, I believe, a singularly unpropitious time at which to allow minor differences of opinion to distract our attention from the main issue. These differences of opinion are sure to be exaggerated and the public will appreciate only the fact that we are not single hearted in our endeavors. The professions of medicine and nursing acting together in sound co-operation cannot fail to win public approval. The profession of medicine and the profession of nursing working apart will lose not only public confidence, but inevitably their standing in the community.

In the great field of medicine and preventive medicine, nursing is the great department in which women have scored a signal success. It is not an accident that in the last quarter of a century they have in this department literally driven the men from the field. This is due to performance and not to accident. In the other departments of medicine, women have scored a less signal success and in the active practice of curative medicine they are not importantly more represented than they were a quarter of a century ago. Looked at from this angle it appears to me highly desirable that the women in all the departments of medicine should unite in their endeavor to put upon the soundest basis nursing in all its ramifications so they may produce the profoundest effect upon the progress of civilization.

THE PRACTICAL SIGNIFICANCE OF THE FUNCTION AND ANATOMY OF THE BASE OF THE CRANIUM AND CRANIAL NERVES IN THE PRACTICE OF OTOLOGY, OPTHALMOLOGY AND RHINOLOGY*

C. F. McCLINTIC, M. D.

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DETROIT, MICH.

There is probably no other part of the body where the anatomy of the parts involved determines so definitely the course which infections may follow and where the physiological response thereto is so frank and constantly accurate as in the head. In the consideration of diseases of the eye, ear and nose, one should also remember that anatomical changes are occurring as the individual develops and that associated with this development are changes in function.

There are certain anatomical and physiological differences between the adult and baby skull. Therefore, in the consideration of the matter before us, we shall first consider the ear of the child.

*Read before Section on Ophthalmology and Oto-Laryngology, M. S. M. S. Annual Meeting, 1923, Grand Rapids.

CHILD'S EAR

In the external ear of the baby the bony portion has not developed. At birth the whole of the external meatus is catilaginous. At one year it is one-third bone, at the age of five or six they are about equal. Sebaceous glands in the meatus of children open into the hair follicles, but do not in adults. At birth the antrum is present and about the size of a small bean. The mastoid air cells are not present. The tympanic mebrane in babies is almost horizontal. The petro-squamous suture is open at birth and permits direct communication between the antrum and the middle cranial fossa; this suture closes at the end of the first year, but a vein, the petro-squamous, persists. At birth the outer wall of the sinus is formed by the post meatal plate of bone which is only 2 mm. thick. (see chart No. 1).

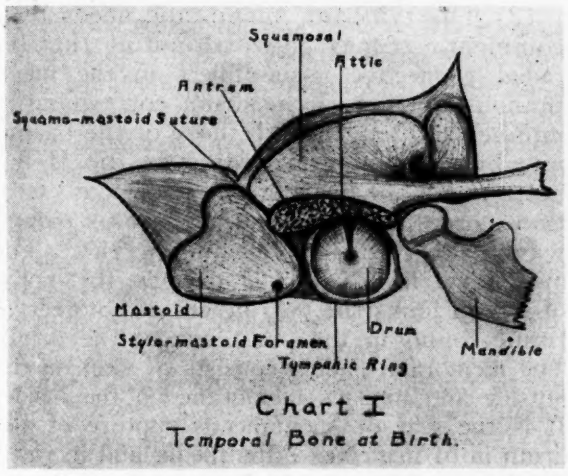


Chart I
Temporal Bone at Birth.

In the child the antrum is at a somewhat higher level than in adults and comparatively superficial and pus may easily escape to the surface or be evacuated. The suture between the post meatal part of the squamosal and the petro-mastoid disappears in the second year of life and so shuts off a possible route for the escape of pus to the surface. As age increases the depth of the sinus from the surface increases so that it varies in depth from 12 to 22 mm. in adults, the average being 16 mm.

Young maintains that some air cells are present at birth in the outer wall of the antrum. The mastoid process appears as a definite structure at the age of two years. During infancy there are two types of mastoid, one in which the bone is dense and persists in one per cent of adults, and another type in which the mastoid is diploetic and is retained in twenty per cent of cases.

ADULT'S MASTOID

In adults there are three types of mastoid, all about equally common: (1) Those in which the cells are large and communicate with one another and the antrum; (2) Those in which the central cells are large and communicate with the sinus while the peripheral are small and closed; and (3) Those in which all the cells are small and closed.

With these anatomical differences in mind, the following practical considerations may be pointed out: (1) In infants the external meatus is directed upwards and inwards, whereas in adults it is upwards and inwards in the cartilaginous portion and downwards and forwards in the bony portion. This is significant in the use of specula and in operations on the drum.

The presence of the mastoid at birth accounts for mastoiditis being common to all ages. The open petro-squamosal suture makes meningeal infection easily possible. The presence of the post meatal suture accounts for the presenting of pus subcutaneously and its occasional spontaneous evacuation. The thinness of the bone over the antrum renders operation a simple matter in children and also serves to caution us as to the superficial position of the facial nerve, which is always just as far from the surface as is the posterior antral wall. Remember that in children as Young suggests that a few air cells may be present in the outer wall and be overlooked as potential pus pockets.

GENERAL RELATIONS

With these suggestions and others which may occur to the more experienced otologists, let us pass to the consideration of the anatomical relations of the ear in general. From without in we shall consider:

(1) The External Meatus—The external opening of the meatus is elliptical with the long axis vertical thereby calling for elliptical speculae instead of round ones. In the cartilaginous part of the tube, sebaceous glands are numerous and are often the seat of very minute but very painful abscesses. In this region are the ceruminous glands that secrete the wax which, when excessive, forms the plugs which often obstruct the meatus and cause deafness, chronic coughs, yawning and sometimes sneezing and vomiting.

In the cartilaginous floor towards the tempero-mandibular joint are certain fissures—the fissures of Santorini. These permit easier movement of the cartilaginous meatus. It is through these gaps that pus may pass to the parotid from abscess in the meatus or in the reverse direction in parotid disease.

There are neither hairs nor glands in the bony meatus. Polypi may develop from the soft parts of the meatus. Exostoses are

common from the bony part developing at its junction with the cartilaginous segment and therefore some distance from the drum. The skin ,when inflamed, may produce an extensive muco-purulent discharge—otitis externa.

The relations of the external ear are of more than passing interest. The upper wall or roof of the meatus is separated from the cranial cavity by a dense layer of bone. Abscess or bone disease here may produce meningitis. I know of one case of meningitis resulting from the retention of a bean in the meatus. The anterior wall is in relation with the tempero-mandibular joint and parotid gland. The meatus moves with the joint and both have the same sensory nerve supply; as a result, in inflammation of the meatus, the jaw movement is painful, and pain from an inflamed joint may be referred to the external meatus. This relationship also explains fracture of the anterior meatal wall from a blow on the chin. The relation to parotid infection has been mentioned. The posterior wall separates the meatus from the mastoid and 12 to 15 mm. behind the posterior wall is the lateral sinus. The floor is thick and substantial.

The blood supply of the pinna is abundant. We had one case of an ear being severed and when reapplied, healed in place. Due to the absence of fat the rich blood supply does not prevent frost bite and gangrene of the part. Haematoma are common here occuring between the skin and cartilage or pnder the perichondrium from blows upon the ear.

The nerve supply is significant. The pinna is supplied by the auriculo-temporal, a branch of the fifth; the lobule by the great auricular from the 2-3 cervical; the small occipital from 2-3 cervical supplies the posterior surface of the pinna; the vagus supplies the outer lower part of the meatus. Coughing, vomiting, yawning, and sneezing may be associated with ear affections: the yawning, coughing and vomiting resulting from irritation of the vagus and the sneezing from involvment of the fifth nerve.

Since the great auricular in its passage through the neck is in close proximity to the deep cervical lymph nodes and in the face passes through the parotid gland, inflammation of these structures may involve the nerve. Since it passes through between the cartilages and supplies the meatus, ear ache may result from lymph gland involvment. Since the lymph nodes of this area enlarge from infected teeth, tonsilitis, or skin infections, these should be examined in case of obscure earache. Since the lingual and dental nerves come from the same trunk of the fifth as does the auriculo-temporal, these structures should also be examined in pain in the external ear. The region around the tempero-mandibular joint also develops from the same gill arch as does the tongue and mandible so that tenderness in these areas may be associated with ear pains.

Ear rings to relieve eye affections have their anatomical connections explained by the fact that the fifth nerve (ophthalmic division) and the great auricular nerve make intimate connections in the cervical portion of the spinal cord. On this I do not desire to comment further.

Several cases of chronic coughs and obscure vomiting, have come to my notice in which the conditions cleared up when auricular irritation of Arnold's nerve had been removed by proper attention to the external auditory meatus.

(2) The tympanic membrane needs little comment. It may be worth noting that the radial connective tissue fibers in the membranous portion of the drum correspond in number and length with those of the basilar membrane, which, according to the Helmholtz theory of hearing, have a wave vibration corresponding to the various sound waves detected by the human ear. The membrana flacida which bridges the notch of Rivini lacks the two layers of connective tissue found in the parstensa of the drum. The membrana flacida consists of skin on the outside and mucous membrane on the inside. It is the seat of spontaneous rupture of the drum in of neglected otitis media and in cases of chronic otitis media with a discharge it becomes the seat of polypi.

Cunningham has called attention to the observation that in idiots, imbeciles, and feeble minded, the drum forms a right angle with the external meatus instead of an angle of 140 degrees with the roof as in the normal individual.

MIDDLE EAR

(3) The middle ear or tympanum is a mere slit in the petrous portion of the temporal bone placed in an oblique plane and contains the ossicles, chorda-tympani nerve, tensor tympani muscle and stapedius muscle; these structures are covered by mucous membrane and the cavity is lined with it. The distance from its outer to inner wall is from 1/12 to 1/6 inch. In its posterior wall is the facial nerve covered by a scale of bone so thin that inflammation can readily reach the nerve. The roof is very thin and separates the middle ear from the cranial cavity. In the young the petro-squamous suture is closed by a thin fenestrated membrane which permits commun-

ication between the middle ear and the middle cerebral fossa and thus favors the development of meningitis or cerebral abscess from otitis media. After one year the suture closes, but incorporates a portion of the primitive external jugular vein as the petro-squamous vein and thus provides an avenue for infection, thrombosis and cerebral abscess from middle ear infection.

The floor is narrow and its lowest part is below the level of the eustachian tube and the tympanic ring and therefore permits pus to collect and cannot be thoroughly drained either through the tube or through an opening in the drum. It is separated from the internal jugular vein behind and the internal carotid artery in front by a very thin plate of bone. Destructive changes in the middle ear have resulted in fatal hemorrhage from the internal carotid artery. In the floor of the middle ear are a number of folds of mucous membrane over stalagmite-like projections which form pockets in which pools of pus may collect. In the stalagmites and floor are tympanic air cells. These cells when infected, probably are the source of pus in the discharge in chronic otis media. Their removal would endanger the internal carotid artery and internal jugular vein as above indicated.

(4) The eustachian tube opens into the anterior wall of the middle ear. In adults its opening into the naso-pharynx is much lower than its distal end but in children it is more nearly horizontal, inclining at an angle of about ten degrees. This may be a factor in the frequency of otisis media in children. The cilia of the tube sweep towards the pharynx but in certain morbid and other conditions their movements are reversed and thus foreign material may be swept into the middle ear. The openings of the canal for the tensor tympani muscle, which lies in a canal above the tube and the least resistant portion of the tubal wall, is towards the retropharyngeal space, so that pus passing from the middle ear along these avenues usually presents behind the pharynx and forms a retropharyngeal abscess.

(5) Posterior to the middle ear is the mastoid antrum. It lies above and behind the external meatus and communicates with the middle ear in its attic through an opening called the aditus. The sinus is large enough to contain a small bean. It is surrounded by the mastoidal air cells which usually (in 66 per cent of the cases) communicate with it.

The structures surrounding it are:

(a) Above it is roofed by a thin plate of bone 2 mm. thick. This separates it from the temporal lobe and the middle cranial fossa. Small veins perforate this bone and join the petro-squamous vein in the remains of the petro-squamosal suture.

(b) On its inner wall where the antrum opens into the middle ear is the facial nerve and lateral semicircular canal. The facial nerve lies 14 to 22 mm. from the surface in the suprameatal triangle. The relation of the nerve and semicircular canal accounts for facial paralysis and dizziness in operations on the mastoid.

(c) Posteriorly the antrum is separated from the cerebellum and lateral sinus by a plate of bone 3 to 6 mm. thick and when eroded causes thrombosis of the lateral sinus or cerebellar abscess in mastoid disease.

(d) At its opening into the middle ear are located the incus, head of the malleus, and their ligaments. These structures may be involved in mastoid disease and require removal. Some of the veins of the mastoid air cells drain into the periosteal veins and thus account for the occurrence of edema and swelling behind the ear in mastoiditis. It is also to be remembered that emissary veins pass through the mastoid from the veins of the scalp to the lateral sinus. This accounts for thrombosis of the lateral sinus from scalp infections or from application of leeches. When thrombosis of the sinus occurs from infection through the emissary vein there is an associated tender area at the orifice of entrance of the vein.

The blood supply of the middle ear is from the internal maxillary, internal carotid, the petrosal from the middle miningeal, and the stylo mastoid artery from the posterior auricular. Some of the tympanic veins end in the superior petrosal sinus and the lateral sinus and thus account for thrombosis in these sinuses in disease of the middle ear. The petro-squamous vein already referred to crosses the roof of the middle ear and receives branches from the tympanic sinus and the attic and joins the lateral sinus posteriorly and the meningeal veins in front. Note the significance of this connection. By joining the lateral sinus posteriorly, thrombosis of that sinus may result, followed secondarily by cerebellar abscess or meningitis and by joining the meningeal veins anteriorly, meningitis may occur or abscess of the middle fossa may result.

The lymphatics of the middle ear—The lymph drains by two routes—one by way of the eustachian tube to the retropharyngeal nodes where retropharyngeal abscess may

occur; the other is to the posterior auricular nodes.

THE OSSEOUS LABYRINTH OR INTERNAL EAR

Infection from the middle ear may invade the inner ear by the exteranl semicircular canal; according to Scott and West, this is the most common route. It may erode the promontory on the medial wall and enter the cochlea, or it may enter by way of the fenestra ovalis to which the stapes is attached, or through the fenestra rotunda covered by the internal tympanic membrane.

Due to the function of the internal ear, invasion of it may produce two sets of symptoms. If the cochlea is involved disturbances of hearing and deafness result. If the saccule, utricle, or ampullae of the semicircular canals are involved, disturbances in balancing, co-ordination, vertigo, and vomiting result.

From the inner ear the infection has easy access through the perilymph system along the eighth nerve and internal meatus to the basilar cisterns of the subarachnoid space, or through the aqueductus vestibuli or acqueductus cochlea, or by perforation of the superior semicircular canal and thus reach the cranial contents. Sydney Scott maintains that nystagmus on moving the head following middle ear disease usually indicates a fistulous opening in the lateral semicircular canals.

Because of the symptoms accompanying vestibular disease and the functional tests employed in localizing them, it may not be out of place to discuss the central connections of the cochlear and vestibular nerves.

While the cochlear and vestibular nerves are conventionally described as the eighth cranial nerve yet they are anatomically and physiologically two distinct entities. The complete separation however, does not occur until they reach the side of the brain stem, at which point they separate to enter the medulla oblongata under the inferior cerebellar peduncle.

Fibers from the saccule and posterior semicircular canal course to the medulla with the cochlear nerve and there leave it to enter the medulla with the main trunk of the vestibular nerve. The failure to recognize this fact has led to the formulation of those diagnostic hypotheses based upon the idea that these fibers reach the cerebellum through the brachium pontis or middle peduncle, this is Barany's idea which is erroneous.

The fibers of the main trunk of the vestibular nerve have their peripheral endings in the saccule, utricle, and ampullae of the semicircular canals, and the ganglion located in the vestibule of the middle ear. Upon reaching the medulla some of the fibers probably pass direct to the cerebellum without relay. This can be appreciated when we recall that the cerebellum phylogentically and historically has developed from the vestibular nucleus in the medulla.

After reaching the brain stem the two nerves part company and from that point centrally are separate and distinct. The cochlear nerve enters at a lower level and somewhat more lateral than the vestibular. The fibers of the cochlear after entering the brain stem course to their several nuclei in the medulla, the superior olive and trapezoid nuclei in the lower pons region and there relay. After relaying some fibers cross to the oposite side, the majority of the fibers, however, ascend on the same side to higher levels. In their course through the brain step, reflex connections are made with the nuclei of the eye muscle and neck muscle mechanism of innervation, thus providing a reflex response between the turning of the head and eyes in response to sound.

The fibers in the acoustic path course in the lateral lemniscus (fillet). In the dorsum of the upper end of the mid brain the fibers relay in the inferior corpora quadrigeminal body and from there pass to the medial geniculate body and from there fibers pass to the temporal lobe by way of the auditory radiations of the internal capsule.

From these connections you will note that acoustic fibers from each ear reach the temporal lobes of both sides. Destruction therefore of one cochlea will cut off a part of the impulses from each temporal lobe; whereas destruction of one temporal lobe will result in partial deafness in both ears. Complete deafness must result therefore from injury to the acoustic nerve in the cochlea or before the fibers leave their nuclei. Central lesions at higher levels do not produce total deafness in one ear. A central lesion in the auditory pathway, if it can be measured it will be found to be greater on the side of the lesion. Brain stem lesions will be associated with loss of reflex response on the part of the eye and neck muscles to sound. Lesions above the mid brain would not involve these reflexes.

Since the cochlea apparatus developed in land animals after their ancestors left the water and began to respond to vibrations in air, and developed from the vestibular mechanism, I am inclined to the opinion that the cochlea is to a certain degree an equilibratory mechanism. This idea is supported by the histological and chemical identity of

the surface of the organ of Corti and the lining membrane of the semicircular canals.

While the cochlear or acoustic pathway is characterized by its direct connections with the cerebral cortex with only secondary reflex connections with the motor mechanism the Vestibular nerve is characterized by its intimate connections with the cerebellar motor mechanism and all the reflex motor pathways.

When the fibers of the vestibular nerve enter the medulla the fibers are distributed as follows: (1) Some fibers pass direct to the cerebullum without relaying; (2) others pass to the cerebellum after relaying in the medial vestibular nucleus, the nucleus of Schwalbe; (3) Some pass down the cord from the descending vestibular root nucleus; (4) Some pass to the nuclei of the third and fourth nerve nuclei of the midbrain from Deiter's nucleus and that of von Bechterew, from these latter nuclei fibers pass into the median longitudinal fasciculus and make connections with the somatic motor cranial nerves; (5) Reflex fibers make connection with the vagal nuclei and with the solitary fasciculus which connects all of the visceral nuclei. This is the pathway for the production of vertigo; (6) Commissural fibers cross the mid line from the vistibular nuclei and connect the cranial nerve nuclei of the opposite side; (7) A few fibers probably ascend to the thalamic region.

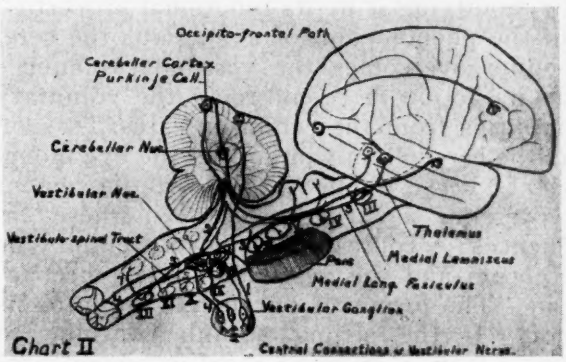
With such intimate and complex connections one can readily understand the difficulty encountered in attempting to localize central lesions in the vestibular pathway.

Without the intervention of cerebellum the vestibulo-spinal, the vestibulo-ocular and the vestibulo-vagal reflex pathways are capable anatomically and physioligically of producing the phenomena resulting from stimulation of the vestibular nerve. (pass pointing), staggering, nystagmus (eye deviation), vertigo, vomiting, may all result from head turning, heat, cold and electrical stimulation of the vestibular nerve without involving the cerebellum.

It is little wonder, therefore, that many hypotheses have been formulated to account for the various phenomena accompanying labyrinthine disease.

In differentiating between cerebellar and vestibular equilibratory disturbance the other functions of the cerebellum should be kept in mind. They are, in addition the maintenance of equilibrium, the regulation of muscle strength, muscle rhythm, and muscle tone. The drunken cerebellar gait is one of weakness. A drunken man's muscles are soft, weak and flabby, but the muscles of a man staggering from vestibular stimulation are hypertonic, over active, dysynergic due to over action, and they are rythmic, it is a condition of overstimulation with hypertonus. There is no doubt but that it is possible for sensations of vertigo in certain vestibular and cerebellar disturbance to pass to the cerebrum by way of or from the cerebellum by a cerebello-cerebral path. But disturbances of the semicircular canals can reach the vagal nuclei and vomiting centers by direct reflex connections in the medulla and the cerebral connections with the vagus account for the sensations reaching the field of consciousness. This is just as easy as it is for warm mustard water to produce the sensation of nausea through the sensory fibers of the glossopharyngeal.

Let us now examine these pathways by a reference to the chart. (Chart No. 2.).



Path 1; this pathway is from the vestibule to the cerebellum direct. Path 2 makes connections between the nuclei of the vestibular nerve and the cerebellum, a pathway a little more complicated than number one. Path 3 makes connections between the VI, IV, III nerve nuclei reflexly through the median longitudinal fasciculus. Path 4 makes reflex connections between the canals and the cord. In path 5 the fibers make reflex connections with the vagal nuclei and through the solitary fasciclulus with all the visceral centers in the brain and cervical cord. Through the connections in three fibers enter the median longitudinal faciculus and make connections with all the somatic cranial nerve nuclei, through paths 6 and 7. Commisural fibers connect the nuclei of the opposite side. See how complete are the motor reflex connections. (1) That connections are made with the cerebellum direct and indirectly, and (2) That no connections are made directly or remotely with the cerebrum.

As pointed out above, as a result of the reflex connections, stimulation of the vestibular apparatus can produce limb movements. For exmple, in slipping and falling

the hands go out automatically (reflexly) for protection. The sensations which afterwards reach the cerebrum are composite combining visual, and muscle-tendon-joint sensations and if you hit hard enough cutaneous sensations may enter the picture, but the muscles responded to the stimulus from the canals before you were conscious of your loss of equilibrium and dignity. This is over path four of the chart.

Stimulation of the canals can produce eye movements, the pathway is three of the chart. This is the mechanism of reflex nystagmus. Stimulation of the inner ear can produce vomiting, pathway five of the chart. Since all of these centers are connected directly with the cerebrum the sensations can readily reach the field of consciousness by the median lemniscus.

Since the vestibular apparatus is connected with the cerebellum directly and secondarily this structure may readily influence the end reactions in consciousness by modifying it by its functional properties. In the phenomenon of nystagmus the cerebellum overcomes the vestibular influence by its action in re-enforcing the voluntary impluses from the cerebrum. Just as soon as the cerebellum can do this the eye movements cease. The to and fro movement represents a struggle between these influences: A contest between cerebellum plus crebrum and the vestibular reflex mechanism. The former is purposive, the latter is not. If the strong stimuli continue to arrive from a diseased canal in which there is a progressive condition the higher centers are not able to overcome it. If the cerebellar connections are broken the cerebral assertiveness will be delayed and the movements will not be rhythmic.

If the disturbances are from cerebellar involvement they will be associated with the hypotonus and arythmia and stimulation of the canals will not exaggerate it.

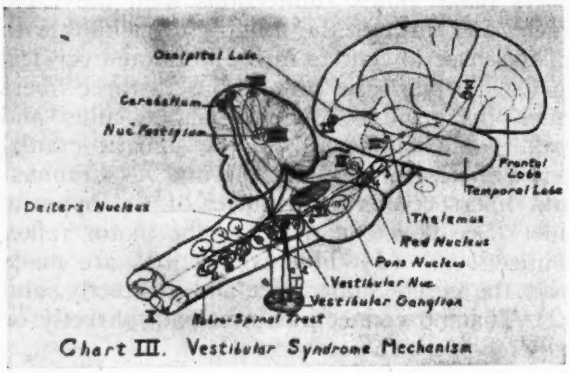


Chart III. Vestibular Syndrome Mechanism

The cerebellar-cerebral connections are represented in chart III; they are one and two and this path from the cerebellum to the thalamus, temporal, occipital and frontal lobes, the fronto-pontile path, the ponto-cerebellar path, to the cerebellar cortex, dentate nucleus, superior peduncle to the red nucleus, and then the rubro-spinal tract to the motor cells of the ventral horn of the cord . Cerevral connections are seen in Chart IV.

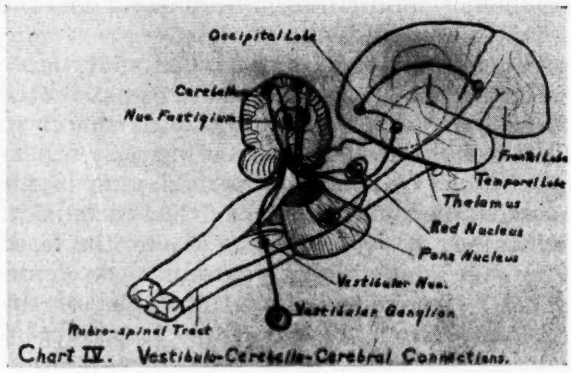


Chart IV. Vestibulo-Cerebello-Cerebral Connections.

Now let us consider the bearing of these connections on the signs, symptoms and tests associated with the diagnosis of disease of the oto-cerebellar mechanism. Normally, equilibration is dependent upon the eye, semicircular canals and muscles. Some othologists assert that any two of these structures can maintain equilibrium. With this I cannot agree, but would state it in this manner, a normally acting musculature plus normal eyes or normal labyrinth can maintain equilibrium.

In both instances the muscles are necessary.

With the anatomical connections in mind let us notice the differences between the reactions in cerebellar or central disturbances in equilibrium, and in peripheral or vestibular:

I. When the semicircular canals are not functioning, stimulation of them produces no nystagmus, no vertigo and no past-pointing. (Lesion in 1.) II. When stimulation of them produces vertigo, and no nystagmus and on past pointing the lesions is probably in Deiter's nucleus. (See chart III, tract a). The cerebellar connections are not intact. III. When stimulation produces no, vertigo, no past-pointing but nystagmus, the lesion is presumed to be in the interior cerebellar peduncle since past pointing is cortical but vertigo should result from vagal connections unless the association fibers from the vagus are cut off; this would indicate a lesion in the floor of the fourth ventricle which could also involve the peduncle. (Chart III, tract b). IV. When stimulation produces no nystagmus, but vertigo, past pointing and falling the lesion has cut off the impulses to the median longitudinal fasciculus above the nucleus. V. When stimuli produces nystagmus but no past pointing, no falling and no vertigo, it means the lesion

has involved the portions of the nucleus that gives relays to the vagal nuclei and the cerebellum, and the lesion is not in the superior, middle and inferior cerebellar peduncles, as Barnay and Fischer suggest.

These men try to isolate the lesion point between the vertical and horizontal canals. This cannot be done because Barany assumes (does not prove) that fibers from the vertical canals enter the pons and then pass to the cerebellum by way of the middle peduncle. He has assumed that the fibers which we have mentioned as running with the acoustic portion of the eighth nerve enter the Pons with that nerve, which they do not. All of the fibers from the utricle, saccule, and ampullae have been demonstrated experimentally to enter the vestibular nucleus in the medulla except those which go direct to the cerebellum and these also pass through the inferior peduncle.

Aside from the purely anatomical and physiological facts there are associated conditions which assist in differentiation between cerebellar and vestibular disturbances. Vestibular disturbances are associated with deafness and increase with disturbances of the canals, and the longer the conditions exist, the less noticeable they become either due to loss of vestibular function or the complete usurpation of control by the voluntary pryamidal tract emanating from the cerebrum and assisted by the cerebellum.

Cerebellar disturbances are not aggravated by vestibular stimulation, they grow worse as the condition progresses, they are associated with weakness, incoordination, diadokokinesia and other manifestations of loss of cerebellar function. Cerebellar nystagmus is less apt to be horizontal and rotary but up and down, oblique or towards the side of the lesion. Closing of the eyes has no effect upon the vertigo or gait. Caloric tests reveal a normal labyrinth.

From a cursory survey of the literature I am convinced that a more thorough knowledge of the anatomy and function of the central nervous system and especially the central connections of the cranial nerves would result in a more lucid statement of labyrinthine symptoms than you at present possess.

NOSE

I have purposely dwelt at length upon the ear because it is the most complicated mechanism included in your specialties. The few remaining minutes we shall devote to the nose since the eye is too large a subject to take up in so brief a time for discussion as is at our disposal.

First let us note the peculiarities of the nose of the child. In the adult the inferior meatus is large and is the chief respiratory passage; in the young child before the superior alveolar ridges develop it is very small and the middle meatus is the chief respiratory way.

The nasal cavities grow rapidly from the sixth to the eighteenth years of life during the period of permanent dentition. At the same time the maxillary sinus is developing and increase in the vertical height of the nose is taking place as a result. This increase in the cavity of the nose is confined to its maxillary or lower portion.

The normal development of the nose and paranasal sinuses is dependent upon the normal respiratory tide. Mal-development results when the respiratory passages of the nose are obstructed by adenoids or other impediments.

In early childhood the frontal sinus is rudimentary. At about the sixth year the rudimentary bud of mucous membrane which has been present at the upper extremity of the hiatus semilunaris begins to push itself into the diploetic portion of the frontal bone. It is fully developed at twenty-five. For this reason children are not affected by frontal sinusitis until after they begin their second dentition. The sphenoidal and ethmoidal sinuses begin to develop at the same time as the frontal. The maxillary sinus (antrum of Highmore) is present at birth, but reaches its greatest development in old age after the alveolar ridges have partially absorbed. The walls of the antrum of Highmore are thicker in children than in adults.

Returning to a general consideration of the nose, it is to be remarked in passing that the skin of the nose is closely adherent over the cartilaginous portion so that inflammation here produces a tension and severe pain; the engorgement produced being due to the rich blood supply. The blood supply at the muco-cutaneous border is terminal and therefore favors congestion. This is true in all such localities as for example at the anal and esophageal opening where piles occur.

The great number of sebaceous glands over the cartilaginous portion of the nose renders it a most favorable location for acne. "Acne-hypertrophica" appears here and produces the appearance described by the English as "grog blossoms." Because of the abundant blood supply, the nose lends itself readily to plastic operations. The nose has been completely severed and when replaced has healed.

The skin over the root of the nose, the alae, and interior of the nose receive their sensory nerve supply from the ophthalmic division of the fifth. This accounts for lacrimation from painful affections of these parts and also

sneezing from bright lights striking the retina.

The cartilaginous portion of the nose is often destroyed by lupus or syphilitic ulceration. Dilating speculae should never be passed beyond the cartilaginous portion of the nose.

The naris is about 1¼ inches in vertical height and a little less transversely, at its widest part. In the posterior nares one can palpate with the finger all the structures seen with a rhinoscopic mirror. The floor of the nose is wider in its middle than elsewhere and the vertical extent is greatest there. For this reason forceps should be opened in a vertical direction.

The superior turbinate is 2 mm. from the septum, and the inferior is 4 to 5 mm. from it. Above the middle turbinate the cavity is so narrow as to be regarded as the surgical roof of the nose. The anatomical roof is formed by the cribiform plate of the ethmoid and measures about 1/6 inch in width. Because of its narrowness it is not apt to be penetrated by forceps of any size. The brain has been penetrated by objects passing through the roof of the nose and the London Hospital reports give the case of a man who ran the ferrule of an umbrella through the nose into the Pons, came to the hospital unassisted, and died several days later. It had passed through the sphenoidal sinus. The peri-neural and peri-vascular lypmh-spaces drain into the subarachnoid space so that infection has free passage from the nose to the sub-arachnoid space. It might be of interest to observe whether rhinitis of the olfactory region with loss of smell more frequently results in meningitis than infections in the respiratory region of the nose.

Meningoveles may protrude from the roof of the nose and in case of cleft palate have presented in the mouth. Their excision here has resulted in death from secondary meningeal infection.

The septum in adults is rarely straight; 76 per cent of them deviate. The French claim that because of the almost universal septal deviation that the nose is rarely straight. They account for the deviation by the practice of always blowing the nose with the same hand.

On the outer wall in the inferior meatus opens the lacrimal duct. It is guarded by the valve of Hasner which prevents inflation of the lacrimal sac from the nose.

The inferior meatus is below the level of the vestibule, therefore catheters unless tilted upon insertion will pass through the middle meatus. The inferior turbinate is about ¾ inch above the floor. The superior meatus is short and narrow. The middle meatus opens up widely in front. Upon the lateral wall of the middle meatus is a deep groove, the hiatus semilunaris. It runs from above downwards and backwards. Into its superior end opens the infundibulum from the frontal sinus and into its lower end the maxillary sinus opens. The anterior and middle ethmoidal cells may open into the hiatus, or into the infundibulm or directly into the middle meatus. The accessory opening of the maxillary sinus, the ostium maxillaris, when present, opens below the hiatus. The upper limit of the hiatus is formed by the bulla and into the bulla the middle ethmoidal cells open above the hiatus.

The floor of the nose slopes from before backwards.

The nasal mucous membrane in the respiratory portion is ciliated columnar epithelium. It is very thick and vascular over the turbinates, except the superior, and on the lower portion of the septum. On the floor and between the turbinates it is much thinner. There are myriads of glands over the turbinates and septum in their posterior and lower portions. These are subject to extensive hypertrophy and their secretions may be mistaken for cerebro-spinal fluid.

The mucous membrane is rich in lymphoid or adenoid tissue. Beneath the mucous membrane of the posterior portion of the inferior turbinate is a rich plexus of veins so large that it is sometimes called the turbinate body. When these vessels become engorged the cushion swells and obliterates the respiratory passage, between the inferior and turbinate and septum.

The turbinates warm the air and filter out dust and floating particles probably including bacteria.

The arterial blood supply to the nose is from the internal maxillary, ophthalmic and facial arteries. The venous supply is of practical significance: (1) The ethmoidal veins enter the opthalmic and thereby drain into the lateral sinus. (2) Through the foramen cecum in children and in some adults there is an emissary vein from the nasal mucous membrane to the superior longitudinal sinus. Bleeding from the nose in children in cerebral congestions, as in fits of anger, may be through this vein. It serves as a safety valve and in the age of appoplexy this vein if present may function with beneficial results to the victim. All of these veins form an avenue for infection to travel from the nose to the intra-cranial regions.

The vascularity of the mucous membrane, its laxity and the poor support given the blood vessels and large plexuses account for the frequency and obstinacy of epistaxis in venous stasis due to tumors of the neck pressing on the large veins or from paroxysmal coughing.

The value of elevating the arms from the sides of the chest in nose bleed is accounted for by the fact that it aids aspiration of the venous blood into the throax.

Often the bleeding point is on the septum one-half inch above and behind the nasal spine.

Cough and bronchial asthma may be explained anatomically by the connections between the sensory nerves of the inferior concha and the vagal centers in the medulla. Often cauterization of the turbinate cushion relieves distressing conditions.

In the upper third of the nose is the pale olfactory mucous membrane. This is the reason for sniffing in attempting to detect faint odors. In doing so the nostrils dilate. The dilation is effected through the facial nerve. For this reason impairment of smell often results from facial paralysis without involvement of the olfactory nerve.

The olfactory nerves pass through the cribiform plate and the olfactory bulb rests upon the plate. Therefore fractures through the middle fossae usually injure these structures, with resulting loss of smell.

Your attention was called to the drainage of lymph from the upper part of the nose into the subarachnoid space. Lymph from the lower portions of the nose drains into the retropharyngeal nodes, therefore in diseases of the nose palpate the pharyngeal walls through the oral pharynx in examining the lymph glands. The cervical nodes are not involved as in disease of the tonsils, teeth and eyelids.

With a few more words about the paranasal sinuses let us remark that in the London Hospital reports, over 15 per cent of all subjects examined post mortem showed disease of one or more of the sinuses. Sir St. Clair Thomson estimates that the sphenoidal sinus is diseased in over 30 per cent of the aged. The total capacity of the ethmoidal, sphenoidal, maxillary and frontal sinuses is more than twice that of the nasal cavities.

Our personal view of their functions is: (1) To add size and strength to the bones of the skull with minimum weight; (2) To provide resonating chambers; (3) Aerate the bones of the skull; (4) Probably, according to Dr. Jas. Adam, to warm and moisten the inspired air.

The frontal sinus is very variable in size, extent and shape. Our observations on over 1,000 cadavers in the dissecting room lead us to the conclusion that in from 40 to 60 per cent of individuals the frontal sinus extends over the orbit, causing a double orbital plate of the frontal bone. In over 50 per cent of the cases it extends further up into the forehead region of the skull than is usually stated in text books.

The duct from the sinus is ¾ inches long; it runs obliquely backwards and downwards. We do not believe that the rhinologist can probe the sinus through the duct. The frontal duct joins the bulla and the openings from the ethmoidal cells so that by breaking down the bulla and the anterior ethmoidal cells the operator can facilitate the emptying of the infundibulum. The duct is often torturous and in these cases it has to be opened from the inner end of the superior border of the orbit. It may empty its contests into the hiatus and fill up the antrum of Highmore and make of it a cesspool for chronic discharges from the frontal sinus.

The structures in relation to the sphenoidal sinus are:

(1) Cavernous sinus and its contents; (2) Internal carotid artery; (3) Optic nerve; (4) Maxillary division of the fifth nerve; (5) the pituitary body on its roof. The veins of this sinus join the ethmoidal and drain through the ophthalmic into the cavernous sinus, and so make a possible route of infection.

The maxillary sinus (antrum of Highmore) is so situated that tumors from it may grow (1) through the thin roof into the orbital cavity; (2) through its thin lateral wall into the nose; (3) into the cheek; (4) occasionally into the spheno-maxillary fossa. The infra-orbital and anterior and middle superior alveolar nerves pass through in the inner side of the antrum so that tumors and inflammation in it may involve these and produce facial neuralgia, or tooth ache.

The only rational place to open the antrum is through the canine fossa unless the second or third molars are decayed, when their sockets make a good place for drainage. Its opening into the nose is on a level with its roof and its floor is below the level of the palate. For this reason it cannot be satisfactorily drained through the lateral wall of the nose as some surgeons insist and as is being taught in some of our schools even now. The results obtained by some recent graduates in draining the antrum justify the foregoing remarks.

EMISSARY VEINS

In closing let us call your attention to the system of emissary veins in the skull and the peculiarity of the physiology of the venous circulation in the head and its significance.

Attention has been called to the mastoid emissary vein, the petro-squamous vein from the middle ear and mastoid, the nasal joining the ethmoidal and entering the ophthalmic and eventually emptying into the cavernous sinus, and the connection between the nasal and superior longitudinal sinus through the foramen cecum in children and in some adults.

There are usually one or two parietal emissary veins which communicate with the veins of the scalp on the outside and the meningeal on the inside of the skull; there are also two through the occipital bone. These can and often do convey infection from the scalp to the meninges.

There are emissary connections through the foramen magnum of similar arrangement and significance to the former.

The two most important connections aside from those already mentioned are (1) The facial (angular) vein at the inner angle of the orbit which anastomoses with the ophthalmic. Through it infections from the front of the face and eye region can pass to the cavernous sinus. Many fatal cases of meningitis, cerebral abscess and thrombosis have resulted from such a simple thing as a pimple below the eye because of this avenue of infection.

The veins in the masseteric and temple regions on the side of the face make connections with the venous pterygoid plexus which lies on the pterygoid muscles in the maxillary fossa. This plexus communicates freely by way of the middle foramen lacerum by means of emissary veins with the cavernous sinus. So that infections from the temple and side of the face can readily reach the cavernous sinus and produce thrombosis, abscess and meningitis.

There are a few less important emissary veins which we shall omit.

The reason for the great part these veins play in conveying infection from the surface to the cranial cavity is understood when we recall the effect of respiration upon the flow of the venous blood in the skull and neck. The surface veins, facial, ptergoid, nasal, mastoid, occipital etc., are under atmospheric pressure and drain into the external jugular which is also influenced by atmospheric pressure. The internal jugular is under the deep cervical fascia and due to its arrangement and the action of the omo-hyoid muscle this vein is not affected by atmospheric pressure. On inspiration a negative pressure (intrathoracic) is produced in the internal jugular so that the blood in the sinuses of the skull is sucked (aspirated) into the throax. This results in a lower venous pressure in the lateral, cavernous, superior longitudinal and other venous sinuses than exists in the veins outside the skull, the result is therefore that the blood current in these surface veins is directed to the sinuses within the skull. This condition results in fascilitating the passage of infective material from the surface to the meninges and the brain.

INDUSTRIAL MEDICINE

A. M. SHAEFFER, M. D.
JACKSON, MICH.

Francis Bacon said, "The poets did well to conjoin music and medicine because the office of medicine is but to tune the curious harp of man's body." In all ages music has been credited with a potent influence. Gideon conquered the Midianites with the blare of trumpets. The medicine man of the American Indian tribes employed musical instruments as an important part of his medical outfit.

However, before prescribing music as a soothing agent to an employee in a factory, the industrial physician must be certain of his prescription. Otherwise he might find himself in the predicament of the doctor who attempted to treat an employee of a melancholic turn of mind. The doctor told him to be optimistic and whistle at his work. Imagine the chagrin of this physician when the man replied, "Doctor, I can't, I'm a glass blower."

The conservation of life and limb of those gainfully employed and the reclamation of those disabled in the industrial world have become a definite program in which we are mutually interested. Statistics of the last few years show that among a large group of industrial wage earners, industrial hazards were responsible for only one-quarter of the total accidental deaths, while the remaining three-quarters were caused by public and home accidents. This is significant and should interest us in a program of prevention of accidents and minimizing health hazards outside of as well as in the industrial world. The humanizing influence of this work is far reaching in contributing to the health, comfort and contentment of the working force and their families.

The human machine is without question the oldest as well as the most intricate machine in industry. From the earliest to the most recent record of man, the destructive agencies of nature such as fatigue, infections, accidents and unhygenic surroundings have decreased his efficiency and robbed him of happiness. In more recent times, when expensive and complicated machines have been used, they have been studied in order to preserve their mechanism and obtain maximum efficiency. Until very recently the human machine was neglected. Inventors have devised miraculous machines to do seemingly impossible operations. Yet men must direct and operate these highly specialized machines. If the man power ceases to work the machines cease production. Today the service rendered by the

industrial physician reflects its importance by keeping the employees fit so they can produce one hundred per cent efficient work and in aiding the management to declare profitable dividends for their stockholders.

The human body is estimated as having more than twenty-six trillion cells. The normal life cycle has three phases, development, maturity and decline. Each of the first two phases lasts about thirty years and the third should be at least of equal length. We find individuals in all three phases of life engaged in industrial pursuits. The prevention of sickness, accidents and inefficiency in any portion of the life span of the employee is the purpose of health supervision. The factory hand of today may be the executive in the office tomorrow. Many captains of industry have risen from the ranks.

It is estimated that there are forty-two million people gainfully employed in the United States today. We have fifteen thousand wage earners in Jackson. This huge army of working people to which Jackson contributes her quota is vitally affected by eliminating accidents and health hazards. In the World War, especially designed machinery was used for killing and wounding carefully picked strong bodied men. Yet the actual killing of the United States soldiers only slightly exceeded the number killed in industrial plants in the same period. Think of it! In the World War our casualties amounted to approximately 70,000, and in the same period we lost, through industrial accidents and health hazards, about the same number of men. In other words, our enemies found it difficult to destroy as many lives as we sacrificed in our factories.

Let me bring it closer home. We have 15,000 industrial wage earners in Jackson today. If the deaths and injuries in the industrial world should be equally distributed, fifty Jackson men would die within the year from their own carelessness or from the carelessness of somebody else. In this list of fifty no doubt some of you will find somebody in whom you are vitally interested. Keep in mind I am only speaking of deaths due to carelessness. I have not mentioned those injured and recovered. I have said nothing of those suffering from disease contracted from a fellow worker, or some other form of hazard connected with industry.

We ought not to have this sacrifice of men, we do not want it and we have the power to prevent it. The army demonstrated the value of periodic physical examinations. Periodic physical examinations of industrial workers have been found to be a factor in saving one-half the premature destruction and preventing an economic loss of untold millions of dollars. One of our large insurance companies has made careful physical examinations, pointing out physical impairments and advising their employees. In ten years there was a material reduction in mortality in each and every decade of life. Between the ages of 50 and 60 there was a saving of 53 per cent in expected mortality. In no decade was the saving less than 15 per cent.

These figures show that a periodic health examination of individuals, whether they are industrially employed or not, is a definite, practical, common sense way to forestall disease and suffering. Not only a longer life, but what is equally important, a more useful, a happier and healthier life results.

Our industries have noted the need of physical examination and health education. They are enlisting medical aid in the application of available scientific information. Industrial medicine has shown that the death rate in industry is no more a constant figure than the death rate was constant in countries having yellow fever and malaria prior to the control of the disease carrying mosquito. In the past there was a haphazard method of sizing up new employees, classifying them and assigning them to various jobs. Today there is a careful study of the various occupations and their requirements and the applicants are examined with these requirements in view.

Protection to the eyes of workers illustrate this. The eye conservation work is an outstanding factor in industrial safety. Industrial accidents are responsible for an injury to the human eye every two and one-half minutes, day and night, three hundred and sixty-five days in the year. Ten people from the 15,000 Jackson wage earners have reported today to the medical departments of their industrial plants for eye treatment, necessitated by some industrial hazard such as flying steel, emery, or other foreign particles. Much has been done to alleviate the eye accidents in industry. Protective goggles are provided by practically all plants. These goggles are so constructed that the lenses do not fly into pieces if broken by a flying chip of steel, as ordinary glasses do. But too many workmen still wear their goggles in their pockets except when they are watched. There are still too many instances where toothpicks, matches, handkerchiefs, pocket knives and even tongues of workmen are the instruments employed to remove cinders and other particles from the eyes of fellow workers.

Many cases of defective vision of one eye of industrial workers are brought to their

attention the very first time when they are examined with relation to visual requirements of the work they are to do. We recall one case in which almost total blindness of an eye was discovered when a cinder was removed from it. This worker had undoubtedly been almost blind in this eye for years. By suitable glasses and eye exercises his vision was greatly improved. It is a simple proposition to find out whether a man has good eye sight or not. All we have to do is to put him at a standard distance away from a standard test card and see if he can read it. If his standard is very low, we look into his case further before placing him on the job he applied for. There are two reasons for this. If he has a very low vision, sooner or later, he will have an accident because of poor eye sight, and the employer is going to lose a lot of time and incidentally pay for the injury. It is just plain ordinary humanity to find out whether the man can see enough to do the work.

About two-thirds of the industrial accidents are due to lack of organization and educational methods, while one-third is due to lack of mechanical guards or equipment. So the bigger problem is to reach the new employee and get him interested in himself. We have in one of our local factories a blind man who was taught to operate a drill press three years ago. Since then he has efficiently operated it and has never had an accident of any kind. The industrial physician knows that an ounce of prevention is worth a pound of cure. The A, B, C of industrial medicine is "Always be careful." One case of blood poison costs more than all the time expended in urging employees to keep small injuries cleaned and properly dressed.

The medical organization with which I am associated cares for a large number of local accidents each year. Something over five thousand surgical dressings are required. Monday used to have more accidents than any other day in the week. That changed when prohibition went into effect. That is another good argument in support of prohibition.

It is true that the new employee in the first month is six times more liable to accidents than the older employee. So anything which prevents labor turnover, prevents accidents. The physician interested in industrial medicine comes in most intimate contact with the problems of prevention of human suffering and physical failure. He sees the need of a thorough and critical analysis of the human body before a general breakdown occurs. How much better is the early detection of the abnormal and the diplomatic correction of these faults before there is time to label a permanent defect and classify the advanced disease. It is far better and easier to prevent a disease than it is to cure it, even though it be less spectacular.

The prevention of epidemic diseases such as small pox, typhoid fever, scarlet fever, etc., increases the safety and the production of the personnel of an industry. The pointing out of existing tuberculosis in any employee may be the saving of a human life, a commodity which cannot be replaced. Those industrially employed are benefited by occasional rest periods during work hours, the breaking of monotony and the lessening of fatigue in certain work. The observation of various factors, such as first aid medical attention, ventilation, light, cleanliness, lunch rooms, etc., all come in the domain of industrial medicine.

But achievement imposes obligation. The progress made by industrial medicine in keeping employees efficient, contented and always on the job, is gratifying. This service has safeguarded the employer as well as the employee. But the most gratifying feature of all is the vision that it brings of future progress. Humanity in other fields of endeavor will see and feel the benefits derived from this service and will use this knowledge for its own benefit. And the greatest benefit will be the common understanding that the welfare of one class of humanity is the welfare of all.

TREATMENT OF ADVANCED CANCER OF THE UTERUS WITH HEAT AND "STARVATION LIGATURE"*

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Carcinoma is more vulnerable to the application of heat than to any other known agent. One difficulty with heat in the treatment of cancer has always been a lack in knowledge of how most effectively to obtain from its employment, the maximum benefits. At present there are two methods by which heat can be applied effectively to cancer invaded tissues; one, the cautery, the more familiar procedures with which are the basis for whatever recognition it has received in the past in the treatment of this disease, the other is the method under discussion in this paper, the continuous application of low degrees of heat, temperature to be continued for one or two hours at a point less than required to produce actual

*Read at Detroit, Mich., in a symposium before the General Meeting of the Wayne County Medical Society, March 17, 1924.

cauterization of tissue. It is particularly applicable to treatment of carcinoma of the cervix. The heat should be so applied as to be destructive only in a minimum degree to normal tissues, acting in the greatest measure as a destroyer of cancer cells in any portion of the birth tract. With the apparatus devised by James F. Percy, the heat is easily regulated and controlled. So applied, its advantages over Radium and X-ray are its simplicity, its freedom from danger as well as the comparative cheapness of the required apparatus. Its use is not followed by radiation sickness, and I have had cases with the uterus absolutely fixed in the pelvis, in which at the end of one heat treatment the uterus was rendered movable; thus changing immediately a mechanically inoperable condition into an operable one. Whereas the radiation sickness which follows X-ray or radium, delays operation and is rapidly followed by new connective tissue formation in the parametrium with decreasing mobility of the uterus, thus increasing mechanically operative difficulties. Furthermore, heat is disseminated by conduction rather than by radiation and is therefore absolutely controllable. This, coupled with the fact that the thermal resistance points of normal and malignant cells, being much further separated than with other agents, X-ray and radium, makes heat the logical method of choice.

We will now turn from the consideration of heat to the "starvation treatment" which is today an established procedure in the treatment of advanced cancer of the uterus. It consists in ligation of the internal iliacs, the ovarians, and where deemed necessary, the mediosacral arteries. The ligation is applied to lessen the nutrition of inoperable new growths, thus checking their further development and often causing their disappearance. The use of the "starvation ligature" mechanically accomplishes instantly in the blood supply what a study of a microscopic specimen of carcinoma shows nature is endeavoring to accomplish. Immediately upon ligation of the above named arteries, one can observe definite blanching of the uterus and its adjacent structures.

Since the malignant cells are five times more vulnerable to heat than normal cells, it is therefore not hard to see that in cutting down the blood supply by ligature, still further lessening it by sealing the smaller vessels with heat, and also, through the heat producing an increase of connective tissue which further protects against the ingress of the malignant cells; we may destroy them, and yet have sufficient collateral circulation maintained to nourish the normal cells. Then, too, if not supplemented by the "starvation ligature," radiotherapy often fails to destroy malignant cells whose nests are in or near the large three coated blood vessels from which they draw sufficient nourishment to withstand its effect. Again, the "starvation ligature" so slows the blood stream that the cooling effect, which it normally has is destroyed, thus enhancing the value of the heat treatment because the cancer cells in the arterial wall are now just as vulnerable to heat as cells located elsewhere. Five years ago, I first used this method of treating advanced cancer of the uterus; using heat as above described, combined with the "starvation ligature," also removing any enlarged post peritoneal lymph glands found between the receptaculum chyli and the obturator foramen. In accordance with Beatson's theory of the presumptive influence of ovarian irritation upon the cancer growth, the tubes and ovaries are removed when consent is obtained. A further advantage in double oophorectomy and salpingectomy is the extension of the area of lymphatic block. Another advantage in the use of heat in conjunction with "starvation ligature" over X-ray and radium is that in young women, where the patient so demands, the menstrual cycle can be preserved. Whereas, when X-ray or radium is employed, the patient is sterilized and the menses cease. A case in point.

Case No. 632-C. Housewife, age 28, weight 165 pounds, nullipara, denies ever having been pregnant, and has never been ill. Cause for consultation: First noticed bleeding five years ago. It is accompanied by pain. At first patient noticed a spot of blood on clothing, only occasionally, three or four times a month, with some discharge before her period; this has gradually progressed. About a month ago she took a great deal of exercise, walking, climbing hills, and bathing daily, which seemed to make her bleeding worse. She has worn napkins daily for the past month. For the last two months she has had a yellowish discharge, mixed with blood and pus, attended by a foul odor. Vaginal examination reveals an extensive fungus mass bleeding readily. Clinical diagnosis: Advanced carcinoma of uterine cervix. Diagnosis by pathologist, from currettings: Medullary, basal celled type of carcinoma of the cervix uteri, actively growing. Consultation: Diagnosis concurred in and advised by consultant to abstain from operation, as case is hopeless. Operation, August 16, 1920. Percy heat was employed, coupled with ligation of both iliacs and both ovaries. Patient left hospital during third week after an uneventful recovery. Though no bleeding ever occurred after this operation, there was a small area about the cervical canal which was slow in clearing up. One radium treatment promptly disposed of this. I saw her in my office one week ago today. She is perfectly well. Patient now weighs 190 pounds, having gained 25 pounds since the operation. The cervix is healthy and she menstruates normally and regularly three days in each month.

The heat and "starvation ligature" treatment is particularly indicated in that unfortunately large number of so called in-

operable and incurable cases of cancer of the uterus where there is an extension of induration into the vaginal or rectal wall or both, the uterus fixed and often a sloughing, bleeding, putrid mass stretching and filling the vagina.

The advantages of the method:

(1) Controlling hemorrhage. (a) Immediate. (b). Remote.

(2) Checking extension of malignant growth.

(3) Mitigating physical pain and mental suffering.

(4) Diminishing absorption of poisonous products.

(5) Facilitating the discharge of pus and necrotic tissue.

(6) Permitting the application of other surgical and non-surgical measures.

(7) Giving a psychic adjuvant to the physical measures employed.

(8) Preserving the menstrual cycle in young women when desired.

(9) As a preliminary to any form of treatment of cancer of the uterus; whether X-ray or radium or a contemplated panhysterectomy.

This leads me to repeat that the use of heat and "starvation ligature" should precede a contemplated panhysterectomy; and to add, that while I do not want to be misunderstood as decrying the use of X-ray and radium in the treatment of advanced carcinoma of the cervix as useful postoperative adjuvants, they should, however, never in my opinion be used as preoperative measures, and if X-ray or radium is to be employed in preference to heat, their value will be enhanced by antedating the procedure by the use of the "starvation ligature."

From a series of eighteen patients, the youngest 28, the oldest 56, with an average age of 43, there was no immediate mortality. Of these, every one showed improvement locally. One died later of sepsis. One, on whom ligation was not done, but heat used following incomplete operation, improved locally and in general health, until later, when against our advice radium was employed. This incidentally was immediately followed by extension of the growth. Eleven of the eighteen patients or 61 per cent, are living. In six of the eighteen, or 33 per cent, operation is too recent to draw any conclusions except to say that one of the six has shown no improvement in her general condition, although locally her symptoms are improved, in that bleeding, discharge and odor are almost nil. Of the other twelve cases, all but one for a time showed improvement both locally and in general health. One has been lost track of, six have died, the time averaging nineteen months. Five, or 28 per cent, are alive and well, with no subjective or objective evidence of return. Of these, the shortest time of apparent cure is one year and ten months; the longest three years and seven months, with an average of two years and nine months.

Before closing, I want to add a word regarding the apparent destruction of the cervix by a malignant growth, and its complete restoration in normal looks and appearance, after the carcinoma was destroyed by heat. In several of my cases where the carcinoma involved the cervix and uterocervical junction, there has been a complete restoration of the cervix to normal appearance and in at least one of the series, the menstrual cycle was maintained.

Please remember that these patients were submitted to the heat and "starvation ligature" treatment because, from a clinical standpoint, they were considered otherwise of the utterly inoperable type. I am more than convinced that over any other form of treatment, it has not only the advantage of a low primary mortality, but in addition a largely increased percentage of lives are greatly prolonged in comfort, with freedom from hemorrhage, exhaustive and offensive discharge, and mental distress. More than this, there is an appreciable number of symptomatic cures extending over a period of years.

Surely, if no permanent cure has been effected, the relief from symptoms and prolongation of life has made this work abundantly worth while.

Finally, the principles that I am trying to reveal are that,

(1) Cancer abhors heat.

(2) By proper ligaturing, cancer can be starved without destroying normal tissues.

(3) By combining the two methods, results will be uniformly better.

INTRATHORACIC GOITRE

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INTRODUCTION

Intrathoracic goitre is not a disease entity any more than other enlargements of waywardly placed thyroid tissue, as the sublingual goitre, submaxillary goitre, or upper cervical goitre, but it has such important relationship to vital organs in its location in the mediastinum, and the recognition with the differential diagnosis is of such vital significance that we are permitted to discuss it as an entity. As you are well aware, I have previously tabulated, and published a study of the necks and the incidence of goitre in some twenty-two

hundred persons in our district, and we all know that the prevalence of goitre obtains in nearly the same proportions throughout the greater portion of the upper peninsula. Therefore, in the goitre belt, it behooves us to be on guard for this condition. I feel that intrathoracic goitre occurs more frequently amongst our thousands of goitre patients than has been recognized. Crotti, with his Kocher experience, gives 25 to 35 per cent of all goitres deep into the upper thorax and 15 to 18 per cent he considers totally or partially intrathoracic, while Hertzler gives only ¼ of 1 per cent as the latter proportion.

In my own experience, based upon the examination of thousands of necks, pre-operative and post-operative, about 20 per cent I found to be deep in the upper thorax and about 3 per cent were so deeply located as to be classed as intrathoracic.

Crotti's and Hertzler's excellent articles on this subject can well be carefully studied to great advantage.

Intrathoracic goitre is one that lies in the thorax. Kocher describes ptoses of the cervical organs and mentions thyroptosis as a dropping down of the whole gland and isthmoptosis of Kreuzfuchs as a dropping down of only the isthmus. The portion in the upper chest may contain extension of both lobes, (double intrathoracic goitre), or the original thyroid gland. They are called deep goitres when the cervical goitres dip into the upper chest behind the manubrium sterni; partial intrathoracic goitres are those that have their greater portion beneath the sterum, and totally intrathoracic goitres are those that are totally in the mediastinum.

The human thyroid apparatus commences in the embryo as an evagination from the anterior portion of the pharyngeal wall in the posterior juncture of the three divisions of the tongue, (later the foramen caecum). Therefore, it is primarily a bud of the digestive tube—(the tuberculum impar of His),—proceeding down the neck as a set of cells, not a fusion of two lateral lobes, at the level of the second bronchial arch and the first aortic arch. It is the aortic arch portion that may carry with it an accessory thyroid gland into the mediastinum that eventually grows into a pure intrathoracic goitre.

So the latter may be an accessory thyroid gland goitre or an extension of the originally located thyroid gland.

When the totally intrathoracic goitre is not impacted and small enough to arise on coughing and deep swallowing, it may be a "plunging goitre" of the earlier authors.

The condition under discussion is more common in the males, according to Crotti, on account of the heavy lifting and the larger chests of this sex. Youths occasionally present themselves with intrathoracic goitres and they may also be present in the new born. In rare instances the mediastinal goitre may be congenital, but it usually appears first about the fortieth year.

PATHOLOGICAL ANATOMY AND RELATIONSHIP TO OTHER ORGANS

The pathological anatomy of the thyroid tissue, so placed, may take upon itself all the changes and degenerations that normally located tissue does, and I wish to emphasize the fact that unrecognized intrathoracic goitres that become hyperplastic or malignant can present the most tangled set of consequences that would tax the acumen of the best diagnosticians.

Hyperplasia, adenonatous formations, cystic degenerations, malignancy, etc., all have appeared in the intrathoracic goitres. Brown atrophy of the myocardium, degenerations of the liver and nervous systems, and even exophthalmos result sometimes from the toxic intrathoracic goitres. One of Hertzler's cases had a typical exophthalmic goitre without any cervical enlargement. The hyperplastic goitre lay behind the sternum.

Just hypertrophy alone becomes desperately important when we recognize the near presence of the aortic arch, innominate veins and artery, thoracic duct, common carotid, the sympathetics, both vagi, phrentics, the base of the heart, the trachea and the oesophagus. The goitre may be "pre-vasal," or "retro-vasal." The growth depending upon whether the enlargement is the lobes, lobe, isthmus, or accessory gland, will press against the above named organs because the sternum and clavicular articulations are more fixed. One of my cases demonstrated this very fact by the wedging in between the right portion of the manubrium sterni and sterno-clavicular articulation collapsing the trachea and causing nearly fatal apnoea and cyanosis during primary and secondary anathesia. The injury to the recurrent laryngeal nerve occasionally becomes the symptom to attract the diagnostician to the possible presence of intrathoracic goitre. Anteriorly, amongst the bony limits we have the manubrium sterni, sterno-clavicular articulations and about three ribs, and, posteriorly, three upper cervical vertibrae.

"Sabre-sheath" or "S"-shaped trachea occasionally occur where you have the pressure from both deep lateral lobes at the same level or at different levels.

Intrathoracic goitre may be associated with an enlarged thymus to complicate matters in the youth.

SYMPTOMS—SUBJECTIVE

1. Sensation of choking is quite a common symptom amongst this class of patients and frequently they hold their heads in a fixed position to permit easy respiration.

2. Furthermore, some become so dyspnoeic, paroxysmally, especially at night, that they are forced to sleep in a sitting position, and occasionally are accused of being asthmatics. The peculiar sucking in of the epigastrium and supra-sternal space is called by the French, "tirage."

3. Dysphasia is more common in intrathoracic goitre than cervical goitres.

4. Vertigo and roaring in the ears are complained of.

OBJECTIVE

1. When there is sufficient pressure on the return circulation to the heart we have the caput medusae, and congestion of the head and neck, and even cyanosis and sometimes edema of the corresponding arm. These are, of course, common to other mediastinal growths. This congestion and the pressure on the recurrent laryngeal nerves have resulted in edema of the glottis according to the experience of Kocher, Kreuzfuchs, Crotti, and Crile. The seriousness of this symptom I need only mention to have it appreciated.

2. When we are confronted with the "plunging goitre" on coughing, deep respiration and swallowing, there is a mass appearing at the supra-sternal notch which can be palpated, disappearing into the mediastinum during rest. The pedicle and nonincarceration permits this demonstration which is very interesting as well as startling. If the examiner's palpating hand is held at the supra-sternal notch while the patient swallows, an intrathoracic goitre can be felt, and a small one can be held partially upward for demonstration.

3. Inhibition of the normal upward movements of the larynx and the trachea can be demonstrated by the usual palpation. In aneurysm of the aorta we have the tugging, but this symptom in these goitres is more inhibition and not tugging.

4. Unilateral paresis or paralysis, more common than the bilateral, of the recurrent laryngeal nerves can easily occur as a pressure and stretching result. Therefore, hoarseness combined with any of the pressure symptoms should make us very suspicious.

5. Percussion at the manubrium sterni and the sterno-clavicular articulation will elicit the most important sign of dullness. This varies greatly with the size of the mass and its exact location. I have been in the habit of percussing all persons presenting themselves for examination of the chest, especially goitre cases. In Case No. 1 we have the need for the demonstration of this sign, as without it I am sure my case should have succumbed during thyroidectomy. Furthermore, an occasional unexplained cyanosis and difficult breathing, signifying pressure on the trachea during operative proceedure on other parts of the anatomy on people born in the goitre belt, might be explained by deeply placed or intrathoracic goitres.

This dullness has usually a downward convexity and a change in its size can sometimes be noted on swallowing.

6. Auscultation over the manubrium may sometimes bring out the fact whether the trachea is compressed, by a loud inspiration or a prolonged tubular expiration.

7. The X-ray with its skiography and fluoroscopy gives the most important information in intrathoracic masses and should be the routine in attempting to differentiate the various signs in order to clearly demonstrate and complete the knowledge of the pathology in the mediastinum. In spite of inspection, palpation, percussion, and auscultation the X-ray decides the location and many times the relationship and pathognonomic signs of intrathoracic goitres and other growths. Antero-posterior and lateral-views should be made. This is all emphasized by Nicholls of Crile's Clinic, Crotti, at Mayo's, all the foreign authorities, and, in fact, by every radiologist.

Antero-posteriorly, the shadow is larger than the dullness. It is continuous with the cervical portion when the latter is present and, depending upon the size of it, may extend to the base of the heart or to the third cartilage, and beneath one or both sterno-clavicular articultations. The outline may be smooth if the mass is a single adenoma or colloid, but an irregular undulating border would indicate a multiple nodular growth. When the border is irregular, the mass fixed, with alteration of bony and soft tissue structure, and emaciation, malignancy should be uppermost in the mind of the physician.

To diagnose the presence of a mediastinal growth with certainty is not always sufficient. We must decide whether it is an intrathoracic goitre or not. A cervical goitre may be cured, but we may locate its elongated pedicle and find it nestling behind the manubrium sterni

As was said before, the trachea would be shown by its rings and would denote whether the mass was bilateral, unilateral or median. The aorta would also show, and its displacement downward or to either side would de demonstrated.

The upward movements of the intrathoracic goitre on swallowing and deep respiration would be observed and the lateral angle between it and the aorta would increase its size. These are pathognonomic signs in non-incarcerated intrathoracic goitres that were described and emphasized by Crotti and Nicholls. The angle may be increased and the aorta may rise, but this would be due to the compressed aorta being released as the goitre rises with respiration. The apparent expansile dilatation of the mediastinal mass, synchronous with the heart

beat, can be observed as transmitted and not expansile as in aneurysm.

DIFFERENTIAL DIAGNOSIS

As I have taken up the various symptoms that are important in the diagnosis of this condition, I need only to mention the pathognonomic ones. The entire history of the patient, especially as to the location of birth and residence, becomes very important in attempting to differentiate the mediastinal masses.

On examining a patient we must first note the presence or absence of a cervical goitre, and, if present, outline its lower border, using palpation, percussion and auscultation to elicit it. The absence of a lobe should be noted and a search made in the mediastinum for it, especially when we find a pedicle extending to the supra-sternal notch. Inspect the neck, face, chest and arms for external signs of pressure; compare the two carotids and radials for differences in pulse strength; look for irritation to the recurrent laryngeal nerve and sympathetic; any fixation and ptosis of the larynx; dysphasia; and inquire about the various other subjective symptoms mentioned above.

As the X-ray becomes so extensively accessible to practically all practitioners, we have the greatest help in outlining and completing the diagnosis of this abnormality of the thyroid. Permit me to state here, emphatically, that we should never allow a patient to pass through our hands with the need of a mediastinal diagnosis, without availing ourselves of the X-ray.

The conditions from which we must differentiate intrathoracic goitres are as follows:

1. Aortic aneurysm: With history, heart and circulatory signs, transmitted pulsations and the X-ray demonstrating the varying angle on respiration and swallowing, we can separate with certainty these two conditions.

2. The possibility of a thymus should be considered. The history, especially the age and the X-ray findings will surely differentiate.

3. Syphilitic and tuberculous mediastinitis will resemble intrathoracic goitre, but the temperature curve, Wassermann test, specific treatment, enlargement of the glands (skiagram), and the history will clear the differences.

4. Tumors of the ribs, sternum or vertebral spine, (enchondromata), should be thought of, but with the X-ray and the adherent mass we can easily rule them out.

5. Malignancy of the intrathoracic goitre or other glands would need careful consideration. The history, the age, the circulatory signs and the X-ray findings, as have been described would fix the various signs to make a differentiation clear. Here is where skiography and fluroscopy are essential.

6. Hodgkin's disease may complicate the findings, but the multiple irregular glandular enlargements, the presence of enlarged glands in other portions of the body, the blood picture and pathological examination of a superficial gland will rule out this possible condition.

7. Lung abscess and pneumonia of the apex are mentioned by Nicholls, but with our means at hand for diagnosis we need only mention these.

With all this I am not minimizing the importance of the diagnosis, and recognize its difficulty, especially when we have one of these conditions, and from it, we must differentiate a large intrathoracic goitre. Occasionally, we must admit, a toxic substernal goitre may pass unrecognized.

8. Diverticulum of the oesophagus can be differentiated most positively by the Barium X-ray skiagram and fluoroscopy.

PROGNOSIS

The prognosis depends upon the size and numbers of lobes involved, the location, and whether the adjacent organs are compressed laterally or antero-posteriorly. Stubborn catarrhal conditions arise from pressure. Edema of the larynx is recognized as a very serious complication.

Degenerations, even malignancy, may arise in the displaced thyroid. Infection of, and hemorrhage of the mediastinal goitre can occur, endangering the life of the patient.

You can easily appreciate that toxic intrathoracic goitre with its hyperplasia, and sometimes hypertrophy, bears important consequences, such as, myocarditis, hepatitis and nerve degenerations.

The most important is the tragic "sudden death," "mort sans phrase," that Crotti stresses in his book on goitres. One of Hertzler's cases died during one night's illness from a hemorrhage in an intrathoracic goitre. Anesthesia for operative procedures in other portions of the body may result in a death on the table in an unrecognized case of the malady. Kocher refers to a sudden death occurring a few days after an operation from the disturbance of an old thrombus of the left internal jugular, resulting in a pulmonary embolus.

In the hands of those of us who do thyroid surgery, the successful removal of an intrathoracic goitre gives the best prognosis. Furthermore, operation should be done early, before incarceration occurs, the danger being directly in proportion to the size of the goitre and in relation to the difficulty of delivery of the mass, injury to the pleurae, and pressure of the heart and the vessels at its base.

TREATMENT

As the prognosis depends upon the treatment it is well to describe briefly the surgical application. Operation is best done with a local anesthetic on account of the possible consequences during general anesthesia. We will find a very low Kocher collar incision the best method with the usual high division of the sterno-hyoid and-thyroid muscles, getting wide retraction. One should search for the pedicle as it contains or is closely associated with the large bleeders . If there is no incarceration one can easily deliver the mass by grasping the capsule, but do not be violent on account of the possible adhesions in a calcified mass and the delicacy of the walls of the veins. Once delivered, the removal becomes comparatively easy.

When the mass is large and incarcerated, the difficulty becomes greater, and we must eviscerate a portion before delivering and prepare for rather viscious hemorrhage. If this becomes too severe, direct packing and await a better time (Hertzler), but with sufficient evisceration and drawing on capsule a delivery can be done, and the usual procedure followed for the removal of the goitre.

I must confess that it may not be even as simple as I have described, and one would need use a spoon to assist delivering the goitre and sometimes, as Hertzler and Kocher mention, divide the sternum, articulations or costal cartilages.

The wound is closed in the usual way with a 24-hour drainage after making sure if no remaining hemorrhage.

Case No. 1. Mrs. S. W., who was 53 years of age and married, came to me for a goitre operation. This goitre she had for 20 years or more and for the last 2 or 3 years it had caused a great deal of pressure, preventing patient from resting flat in bed, needing several pillows at night. She spoke of a sensation of trying to "back away" from the choking sensation in the lower part of her neck, especially the left side.

Briefly stated, her history is as follows:

Family history contains nothing of interest, and hers is the only goitre in the family that she knows of, although she is the fourth of ten children. There has not been any tuberculosis nor cancer.

Personal history is also practically negative. She has had no typhoid, nor pneumonia and no children's diseases. Menstrual life was average with menopause at the 48th year of average character. She bore two children, baby 26 years of age.

Examination, May 22, 1923. She was 5 feet, 4 inches tall and weighed 120 pounds. Her mouth contained upper plates and one bad tooth, with tonsils negative. Circumference of neck, 14½ inches. She had a distinctly large palpable, multiple adenomata of the left lobe of the thyroid. The isthmus was occupied by a large adenoma. The right lobe was very small to the palpating fingers, but a small adenoma could be felt just against the clavicle and was a portion of a mass that extended behind the articulation and sternum. In other words, the right lobe had dropped into the chest.

There was a dullness 1½ inches to 2 inches beneath the manubrium sterni and to the right.

The lungs and heart were negative. The abdomen was negative except for a slight tenderness at McBurney's region. Blood pressure was 138/90 and the urine normal.

I operated on May 25, 1923, under a gas-ether (Morgan's) anesthesia. A low collar incision was made and the usual dissection with high severing of the sterno-thyroid and-hyoid muscles on the left side, as that side was very prominent. The patient became cyanotic and even on the rapid severing of the left upper pole to release the pressure, she became more cyanotic, and practically ceased breathing. We lowered her head, administered oxygen and artificial respiration. I then recognized that it was evidently due to the substernal mass. That was quickly attacked and, a large mass removed which was wedged behind the sternum as in Figure 1, 3 inches in diameter and 1½ inches in thickness. Instant relief ensued and the removal of the above and a large left lobe with the isthmus was accomplished, leaving a portion on the posterior capsule of the left side and completing the operation in the usual way by suturing the muscles, and closing the wound layer by layer with subcutaneous silkworm gut in the skin and drainage in the center of the wound. Her pulse after the operation was 70 and fine quality, and she had an uneventful recovery with a good voice and no impairment of vocal cords.

When the mass was removed, on the upper and middle anterior portion could be seen distinct pressure marks of the clavical and manubrium sterni.

I feel that if thorough examination had not been made previous to the operation, and we had no knowledge of the possible intrathoracic lobe, death would have ensued before we realized it. Furthermore, if an operation for some other surgical disease was necessary, the patient would have succumbed, as she was dead to all intents and purposes, if that obstruction had not been diagnosed and immediately relieved.

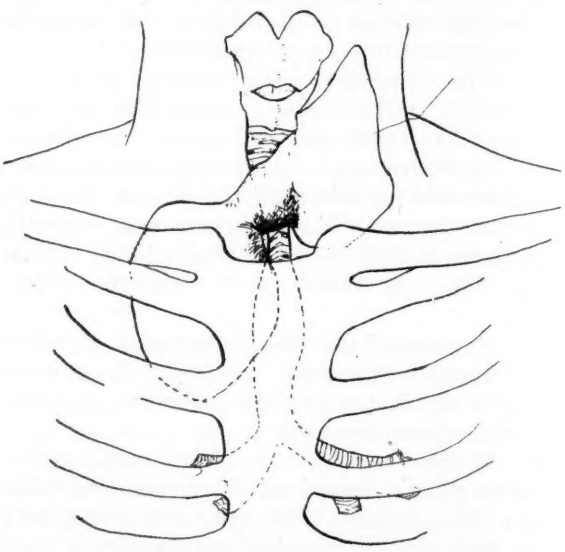

Fig. 1—Mrs. S. W., Intrathoracic Goitre

Case No. 2. Mrs. E. E., 61 years of age and married, who had a massive goitre for 44 years, came to me for operation on May 15, 1916. It was so large

that she was unable to see the pin go into her waistband for over 40 years.

As I present this case only for its example of a deep goitre, I will pass the history sheets and original photographs with the drawing representing the distance below the sternum. (Figure No. 2(.

In her family, we find several goiters. I operated her sister at 50 years of age, for an immense colloid goitre in 1921, and she had one daughter with an adenomatous thyroid and one with a simple goitre out of 4 children.

Her personal history is of no moment except for the presence of this large goitre and its gradual increase with each of her pregnancies and at menopause, the latter occurring at 53 years of age.

The operation was done with ether anesthesia, using the low Kocher incision and division of muscles and capsule. With considerable difficulty I removed 1 pound, 4 ounces of pathological thyroid tissue, consisting of cartilaginous, myxomatous and colloid masses, encountering considerable bleeding that occurs in the presence of large vessels in these large goitres. The posterior portions of both lobes were left in. The space beneath the sternum, after removal, would contain nearly my whole fist. The wound closed in the manner described with the other case.

Thyroid Tumor—Mrs. E. E.

She had an uneventful recovery, leaving her bed on the eighth day.

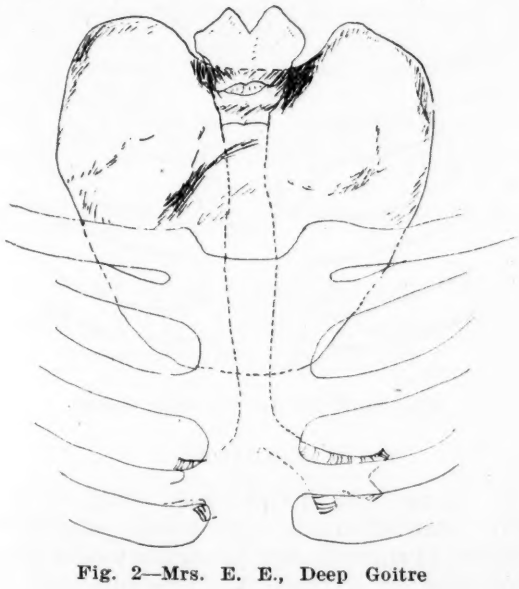

Fig. 2—Mrs. E. E., Deep Goitre

Case No. 3. Mrs. L. H., 23 years of age, married, came for a goitre operation on October 4, 1922. She had this goitre since she was 16 years old and earlier, but it had been growing on the left side of her neck, filling all the space from the left lower maxilla to the chest. She had been very nervous for the last year with attacks of nervous, uncontrollable trembling and shaking lasting 30 minutes to 2 hours. She suffered from palpitation, and was very excitable. She came from a goitreous family, as two sisters and mother were seriously afflicted.

She had been married 1½ years and had never been pregnant.

Examination, October 4, 1922. She weighed 110 pounds, was 5 feet 5 inches tall and not well nourished. The teeth were pyorrhoeic, but tonsils did not show active infection. Her neck contained a large adenomatous mass occupying the isthmus and left articulation and manubrium sterni, pushing the trachea to the right and bulging the sterno mastoid well outward.

Her lungs were o. k. and the heart regular, equal and rythmic, but had a pounding beat of 126-132.

The abdomen was negative and the liver was not enlarged.

Blood pressure was 130/80 and the urine negative.

Diagnosis: A left toxic, deep adenomatous goitre.

Operation: October 19, 1922. A low collar incision was made with the Kocher dissection and wide retraction, severing the muscles high up.

It was easy to lift the large mass from the neck and beneath the sternum. I removed practically the entire lobe and isthmus as the adenomatous mass extended well over to the right. Figure No. 3 gives the relationship of this "deep goitre" very well.

The wound was closed, layer by layer, as described before, with cutaneous silk worm gut in the skin and drainage in the center of the wound. The latter is usually left in only 24 hours.

Patient made an uneventful recovery, getting up on the fourth day.

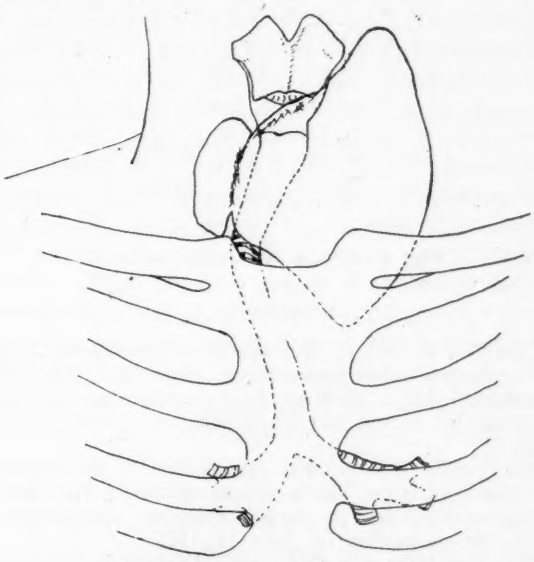

Fig. 3—Mrs. L. H., Deep Goitre

Case No. 4. Mrs. E. B., age 33, married, mother of three children, came to me for goitre operation June 12, 1922. She complained of the mass "pressing on the wind pipe" and interfering with her lying flat in bed.

Her family history and personal history were practically negative except that she suffered two attacks of asthma in the last six months. On examination, she was 5 feet, 5 inches tall, and 129 pounds in weight. Tonsils were negative, but her teeth were pyorrhoeic. Her neck contained an enlarged thyroid with one adenoma in each lobe and one that presented at supra sternal notch being entirely substernal.

Lungs were negative. The heart presented no murmurs and was regular, equal and rythmatic and occasionally intermittent. She had a tachycardia (98-110 per minute) and also a fine tremor.

The urine contained a very faint trace of albumen and had a few hyaline casts in the sediment. The blood pressure was 127/78.

Diagnosis at that time was toxic cervical substernal goitre.

Thyroidectomy was done June 24, 1922, in the usual low collar Kocher method, removing all the adenomatous tissue, leaving a small portion of the right and left lobes on the posterior capsule. I present this case on account of the large space that was left beneath the sternum after the removal of the substernal thyroid mass. This was the portion that caused the pressure symptom, and as the adenomata were hyperplastic, it, no doubt, contributed to the toxicity.

She had an uneventful recovery, leaving bed on the fifth day, stating definitely that the pressure symptom had disappeared, and the throbbing nervousness had also ceased. No doubt this substernal mass also contributed considerably to the sudden dyspnoea or asthmatic attacks.

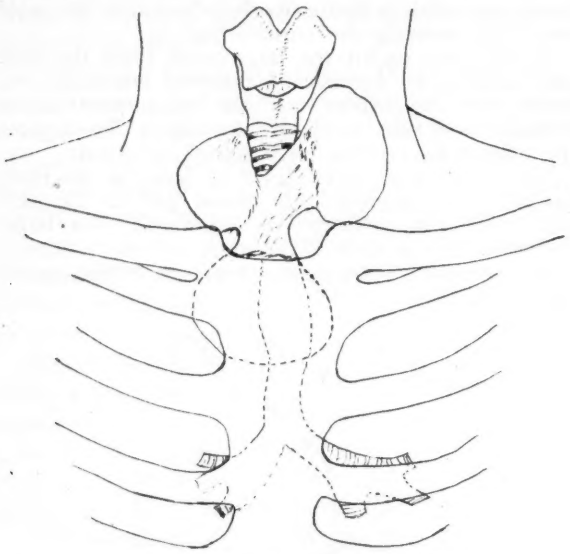

Fig. 4—Mrs. E. B., Deep Goitre

APPENDED

Case No. 5. H. R., Jr., age 24, single, came to me for neck and heart examination, July 16, 1923. He complained of a "choking in the neck" on exercise, on lying flat in bed, and on blowing on a wind instrument.

His family history was negative with the exception that his sister has a simple goitre, and I did a thyroidectomy for a large multiple adenomatous goitre on his mother on June 15, 1923.

Personal History: The only diseases he has had are measles and chicken pox, with no sequelae. On inquiry, I find no history of rheumatism or pneumonia. In 1917 he was operated on for goitre and apparently had a very good recovery. He was not accepted in the draft on account of heart disease.

On examination I found an average, well built young man of about 25 years, 5 feet 8 inches tall, weighing about 142 pounds, with teeth and tonsils negative. In the anterior portion of the neck you observe a low collar scar of the thyroidectomy in 1917, and at the location of the left upper pole, a roundish mass as large as an average egg, 2 inches in diameter, firm and hard, that moves upward with swallowing. This mass had been rather fixed to the trachea and was a recurrent adenoma from a small portion left following the primary thyroidectomy. The examination of the lungs were negative and the heart hypertrophied with the anterior border of dullness just within the nipple line. The cardiac area pulsated and the apex beat laid in the upper border of the sixth interspace on the left. On auscultation we discovered a large roughish presystolic murmur which extended into diastolie. Exercise found his compensation very good. The heart beat and pulse were regular, equal and rythmatic. His abdomen was negative; urine and blood pressure normal.

On account of the choking sensation he desired that I remove this mass in his neck. A thyroidectomy was done December 11, 1923, using the local infiltration of novocain ½ per cent with adrenalin. A low collar incision was made practically within the lod scar, and, with great difficulty on account of scar tissue, the flaps of skin and platysma were dissected up and down. The usual high division of the muscles was done. I removed the adenoma which was roundish, as stated before, about 2 inches in diameter and slightly oblong at the location of the upper left pole. Protrudidng in the supra-sternal notch could be seen a small adenoma, but on lifting it up and attempting to remove the mass, I discovered it to be 2¼ by 2½ by 1½ inches in dimensions and distinctly and totally beneath the sternum, just presenting at the notch with the neck extended. Some difficulty in hemorrhage at the lower end of the mass was encountered. I did the usual closing, suturing muscles and replacing platysma. Two silk worm gut sutures were placed in the skin. He had an uneventful recovery, leaving his bed on the fourth day.

This sub-sternal mass was entirely intrathoracic and acted as a ball valve, choking the patient. The mass at the upper left pole acted only as a contributing cause of the symptoms that I have described above.

Figure 5 demonstrates clearly the location of the intrathoracic mass in Case No. 5.

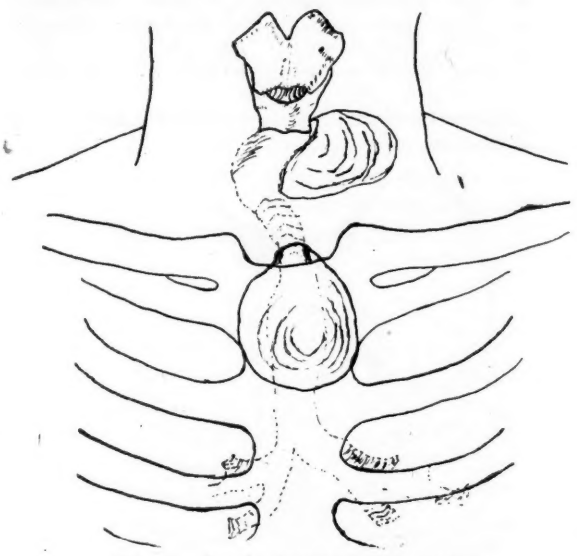

Fig. 5—H. M., Intrathoracic Goitre

SUMMARY

1. X-ray all suspiciously deep or possible intrathoracic growths, especially goitres. If there is any possibility of a ptosis of a lobe or isthmus or pressure on the trachea or vessels, etc., X-ray the upper thorax.
2. Surgery promises the best results.
3. Operate with a local anesthetic.
4. In operating do not handle roughly, and be careful of tearing thin walled veins

that will retract into mediastinum and cause dangerous hemorrhage.

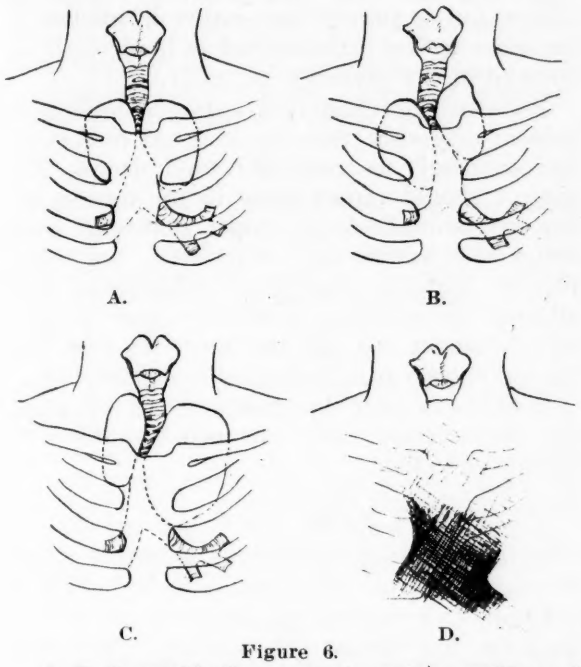

Figure 6.

A, B, C, graphically represents various positions of the lobes and pressure effects on the trachea. D represents angle between heart shadow and intrathoracic goitre. (D, taken from Nicholl's "The Thyroid Gland," Figure 35, page 116.)

5. Think of the possibility of this condition in persons who take a "bad anesthetic."

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*Read at the Upper Peninsula Medical Society at Iron Mountain, August 22, 1923.

THE EARLY DIAGNOSIS OF PREGNANCY WITH PRELIMINARY REPORT OF PHLORIDZIN TEST CASES

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A review of the literature with some such heading as the above shows the need of some new, sure and simple method to aid us in the early diagnosis of the pregnant state. From the physician's standpoint it would be most satisfactory to tell our patients upon their first visit whether or not they were pregnant. The diagnosis of pregnancy at its onset is often of value from a medico-legal point of view; also for an early interruption of the pregnancy where such interruption is indicated. From the patient's standpoint, she is always most anxious to know at once, and often thinks the physician is not very competent or he could tell her with some certainty.

*Read at Harper Hospital Staff Meeting, Feb. 22, 1924.

The use of the X-ray in diagnosing pregnancy is most interesting and is of great help in later months in determining the exact position, whether a single or multiple pregnancy, etc., but is of little or no help during the early stages. After considerable work done on the subject, the precipitation of red blood corpuscles was found not to be reliable. Because of complicated laboratory methods as well as the lack of uniformity of results, the Abderhalden test has been discarded.

In more recent years many articles have appeared discussing the decreased sugar metabolism during the early months of pregnancy. The fact that glycosuria may be seen in pregnancy as a transient symptom has been noted by various writers since 1856. All practically agree that the spontaneous glycosuria usually appears after the sixth month; that it is mild in type; that the sugar excretion is independent of the carbohydrate in the diet; that there are no symptoms of diabetes and that the glycosuria disappears after labor. The recognition of glycosuria as a symptom of early pregnancy is the clinical outcome of work done by Ryser in 1916 and Gruenthal in 1919. The former determined that when pregnant women were fed on a series of different sugars, the blood sugar values never exceeded normal physiological limits. The latter showed that blood sugar curves were identical in non pregnant and pregnant women after ingestion of like amounts of glucose, but that the pregnant woman responded with glycosuria. They found this to be unreliable after the third month. Welz and Van Nest of Detroit in their article on "Sugar Test in Pregnancy," published in January, 1923, reported on 71 cases of early pregnancy in which glucose was given per os to produce glucosuria. Their conclusion was that glycosuria was of no prognostic importance in pregnancy, but of considerable diagnostic value up to the 12th week.

In November, 1923, Long and Hirst of Philadelphia published an article on "Ingestion Glycosuria an Aid to Early Diagnosis of Pregnancy," and in the summary said, "Our series brings added evidence to strengthen the assumption that an ingestion glycosuria can be induced in the early months of pregnancy, that it is a valuable diagnostic aid, and that the glycosuria disappears when the fetal and maternal parts are no longer in physiological relationship. The literature shows a 95 per cent

accuracy with glucose ingestion diagnostic technic in the first three months of pregnancy." The above was the first point in the summary and I will refer again to the article.

Recently Kamnitzer and Joseph working at the Municipal Hospital, Berlin, have tried to prove that a glycosuria can be artificially produced in the early months of pregnancy by the intra-muscular injection of Phloridzin. In the non-pregnant such an injection should not produce glycosuria, nor is it likely in those pregnant over twelve weeks. During the first three months glycosuria should appear. It is the technic of these men that I have used and which I shall explain here with case reports and results. First, however. I wish to mention the work along the same line by several others. Dr. Alfred M. Hellman of New York has reported 24 cases and thinks that although the number is too small to draw definite conclusions, that certainly there is something in the test and deserves further study. Doctors Long and Hirst, whose article was mentioned above, had at that time, November, 1923, only seven cases to report and said in their article, "The Phloridzin technic was thoroughly disappointing. Dr. W. C. Gayler, St. Louis, reported twelve cases and said that the test was "extremely simple of application, fairly accurate and very fascinating."

Kamnitzer and Joseph, after considerable experiment, found the test most reliable when one c.c. of a 2 per cent solution of phloridzin was used. The preparation we use is supplied in one c.c. ampules containing 0.002 gram of phloridzin and 0.001 gram Beta-Eucaine Hydro-chloride.

TECHNIC

The patient is first asked to urinate and this sample is marked control. She is now given six ounces of water to drink and one c.c. of phloridzin preparation is injected intramuscularly. Routinely I have used the hip or thigh muscle as site of injection, although there has been no soreness following injection. One-half hour after injection patient urinates into a clean vessel which is marked (1), and immediately drinks six ounces more of water. This is repeated each 30 minutes until we have the control specimen and three 30 minute specimens. It is well to test the control specimen as soon as passed and if the test for sugar is positive the phloridzin test is not applicable to the case. The samples one, two and three are then separately tested for sugar by the Nylander Test. The Nylander Test is as follows: Dissolve four grams of Rochells Salts in 100 c.c. of 10 per cent solution of Caustic Potash and add two grams of Bismuth Subnitrate. Place on a water-bath until as much as possible of the bismuth subnitrate has entered into the solution. Mix ten volumes of the urine to be tested with one volume of the solution prepared as above and boil. A black coloration or precipitate, either immediately or after a few minutes of boiling, will be formed in the presence of sugar.

As usual with different tests and laboratory aids in diagnosis, this one also has limitations and seemingly its share of complications. The patient should report early in the day so the test can be made on an empty stomach. Such drugs as antipyrine, salicylates, saccharin, chloral hydrate, camphor, chloroform, and adrenal preparations sometimes give a positive Nylander test and one must see that they have not been used before starting the test.

I wish to report the results of the test made on 20 patients, about an equal number of private and clinic.

CASES 1 TO 6

In the beginning, to become familiar with the technic and to become familiar with a negative reaction, I carried out the details as above outlined on five unmarried patients. The ages ranged from 25 to 37. All were healthy individuals and pelvic examinations were negative on the four examined out of the five. In each case the control urine test showed a white precipitate. The first sample 30 minutes after injection—same white precipitate, the second showed smaller amount of white precipitate and the third had no precipitate and the clear fluid was a light color. The white precipitate mentioned above is the normal reaction with the Nylander solution when added to normal urine and boiled, as I tried it on more than a hundred samples from both the male and female with constant result.

CASE 6

Mrs. F.. age 32. Menses always regular and normal. One child two years old. Last period August 13th, 1923. The test made Nov. 30th was positive. Examination at that time and at frequent intervals since show a definite pregnancy and one which was probably within the 90-day period of development at the time of test.

CASE 7

Mrs. B., age 24. One child, one year old. Two weeks overdue. Had often gone two or three weeks past period time. Did not have any symptoms of pregnancy and did not think it possible for her to be pregnant. The test was positive. Later examination showed her to be pregnant.

CASE 8

Mrs. W., age 28. Examined Nov. 23rd, 1923. Last period was Sept. 18th. Periods were always regular and normal. From examination I was not able to diagnose a pregnancy. Test was positive. At the next examination I was able to find signs of pregnancy and which has continued to develop in a normal manner.

CASE 9

Mrs. K., Age 30. Consulted Jan. 7th. Has one child, born March 22nd, 1923. Nursed baby about six weeks. Flowed in May, June, July and Aug., did not flow in September, but had a normal period Oct. 18th. Twice previously when not pregnant she had missed two and three periods. Examination was negative for pregnancy. Test was negative. January 23rd she began a normal period.

CASE 10

Miss H., age 24. Menses regular, normal. Last period Aug. 10th, 1923. Examined Nov. 19th and diagnosis of pregnancy made. She admitted the possibility. Test was positive. Further examination shows normal pregnancy developing.

CASE 11

Mrs. L., age 28. Two children. 1917 left ectopic removed. Last period Nov. 15th. Jan. 7th test made which was positive. This reaction however, was interesting in that it differed from the others. First and second samples were at first negative, but the second sample showed a dark precipitate after being boiled and standing ten minutes. Uterus seemed large and has developed normally for pregnancy since.

CASE 12

Mrs. V., age 31. Para 3. Two abortions, first at six weeks, second two months, both since birth of last child. Periods regular and normal. Last normal period Aug. 1st. Examined Sept. 27th and diagnosis made of two month pregnancy. Nov. 19 and 20th patient flowed quite profusely. Examination showed cervix soft and fundus was not firm and was lying more to the right side than normally. The abdomen was tender. On the 21st of November she began having some contraction pains at irregular intervals. On this day the test was made and was positive. This woman was a clinic patient and was lost track of until a few days ago when I had the Social Service Department look her up in order to complete the record. She miscarried, Dec. 23rd.

CASE 13

Mrsr. T., age 19. Married two years. One baby seven months old. Baby weaned 30 days before examination. Irregular periods. Had a period in July and none since. Erosion of cervix and T. B. had been diagnosed. Test made Nov. 28th was negative, which is correct as verified by several examinations since.

CASE 14

Miss L., age 35. Has missed one period several times since menses began. Denies the possibility of pregnancy. Seen first on Oct. 25th, hymen only slightly ruptured, no enlargement of uterus or other signs of pregnancy. Last period Sept. 10th. I saw her again Nov. 22nd and test was positive on this date. Confronted with the result of this test she admitted the possibility of pregnancy, which was shown to be correct by examinations since.

CASE 15

Mrs. R., age 32. Always irregular. Four years ago one tube and appendix removed. Now four days overdue. Test negative. Menses appeared two days later.

CASE 16

Mrs. A., age 27. First period at 14. Regular, 21-day type, duration four days, no pain. Pregnant at 18—normal delivery. No pregnancy since. September, 1923 began with excessive flowing. Has flowed five times of several days duration during past two months. Some nausea. No pelvic pain. Examination shows a large retroverted uterus and large left ovary. Diagnosis of threatened abortion was made. This date was Dec. 5th, 1923. Dec. 12th she was continuing to have bloody discharge, no pain but complained of an uncomfortable feeling as of a "lump" in lower abdomen. On this date test was positive. I did not see her again until Jan. 9th. She had not flowed since last examination, Dec. 12th. Uterus was smaller, but retroverted and any attempt to put it in proper position caused considerable pain. Patient was again examined on Jan. 23rd, 1924, she had flowed a small amount for two days. As far as I am able to determine this patient did not have a miscarriage, probably never was pregnant and the condition in the pelvis, other than the retroversion, is not diagnosed to date.

CASE 17

Mrs. C., age 29. Complains of pain in lower abdomen, continuing for past week. Periods regular and normal. Has been married four years and had four miscarriages. Last menses Oct. 15th, 1923. Has yellowish vaginal discharge and pain, dull in character, particularly when walking. This is accompanied by nausea and frequent urination. Examination showed rigidity in lower abdomen. No mass felt, Breasts negative. Colostrum absent—cervix soft, uterus forward—large. Diagnosis pregnancy. Jan. 5th test made was positive. Continuing to develop as a normal pregnancy.

CASE 18

Mrs. F., age 33. Complains of amenorrhea, leucorrhea, swelling of lower abdomen. Six years ago had right tube and appendix removed. First menses at age of 15—never regular. Always painful with scanty flow for five to seven days. Never pregnant. Last period Aug. 10th, 1923. Several diagnoses of pregnancy had been made before she came to clinic. The first date of our examination was Dec. 19th and for fourteen days previous to this she had had pains in lower abdomen. Examination reveals a hard mass, smooth and slightly movable. The mass appeared to be the body of the uterus and extended into the abdomen to five fingers breadth below the umbilicus. She says her breasts were enlarged and tender. The test at this date was positive. We examined her several times since and found that the mass was not enlarging as a pregnancy should, that she is having more tenderness in lower portion of her abdomen and for past two weeks has had some bloody discharge. Our diagnosis is a fibroid and we have advised her to enter hospital for further examination and operation.

CASE 19

Mrs. H., age 31. Has had one normal delivery and four miscarriages. First examination was made in clinic Nov. 21st, 1923. The history indicated an early pregnancy and examination showed uterus enlarged to the size of an orange—rather soft—fundus slightly retroverted—cervix soft. Diagnosis of two months pregnancy made. One week later she flowed for two days—stopped for two days and then flowed some each day for one week. Dec. 4th, test was

made and was positive. On this day she was examined and discussed by six or eight members of the staff and a probable diagnosis of fibroid made. She had a very thick and tense abdominal wall and we were anxious to determine the accuracy of this diagnosis and advised the gas and X-ray examination. An appointment was made for her to return the following day, but she did not appear and we have lost track of her.

CASE 20

Mrs. T., age 38. Had a recent irregular menstrual history and was worried mostly because of a rather rapid enlarging of lower abdomen. When standing she had the appearance of being five or six months pregnant. First examination made Oct. 24th, and a diagnosis of a large fluctuating mass filling the pelvis and lower abdomen was made by the first examiner. Nov. 1st she had a normal period of five days—no pain excepting a headache. Nov. 21st she began to flow again, the period this time lasting four days. She claimed to be increasing in weight and size of abdomen and said she was not able to wear her usual corsets. Nov. 25th, examination made and report was as follows: Normal cervix; uterus a normal size and in anterior position with a mass in left side of pelvis. She had another period Dec. 5th, and was sent into the hospital for gas and X-ray examination. The phloridzin test made Nov. 22nd, was positive. Six attempts were made to inject carbon dioxide into the peritoneal cavity through the tubes. Each time a pressure of 220 m.m. and twice a pressure of 240 m.m. was reached. No gas could be forced through. It was then injected trans-abdominally and X-ray plates made. The abdominal organs were negative. There was no tumor mass in abdomen. The uterus was of normal size, shape and position. Both ovaries were enlarged, the left being larger than the right.

It is claimed that in abortion the test will function only as long as most of the placenta is attached. In our patients there was but one abortion case which gave a positive reaction several days after the flow started. However, she did not abort for two weeks following the test, and undoubtedly at the time the test was made the greater portion of the placenta was still attached. It is also claimed that extra-uterine pregnancy does not respond to the test. We have not had the opportunity to try this but if we find it is true it will be an aid in differential diagnosis. Also cases in which blood has been lost since the suspected pregnancy started the test is indistinct or failed entirely. In this class belong patients who have previously undergone abortion or suffer from pelvic, cervical or similar inflammatory complications. This last claim is one set forth by one of the manufacturers of the product and is the result of work done by Kamnitzer and Joseph. The results of tests made on cases just reported do not bear this out. Cases No. 16 and 20 were pelvic inflammatory and gave a positive reaction. Cases 18 and 19 were pretty definitely fibroids and gave a positive action. There is one thing, however, I wish to mention at this point which I have noted in making the tests and which I have been unable to find any mention of in other reports. That is regarding the positiveness of the reaction. Other case reports all say simply positive or negative, but there is a big difference in many of the reactions. Some give a heavy black precipitate immediately when the Nylander solution is added to the urine 30 minutes following the injection of phloridzin. Others only after boiling, other after boiling and allowing to stand a few minutes. In other cases I find the precipitate is more of an amber than it is black and then there are still different shades of amber, depending on the case. I have no proof as to the following, but we may find, after more careful work, that we get the heavy black and rapid precipitates in the cases of pregnancy up to the third month, that it is during the one to six weeks period that the greatest degree of reliability prevails and when it will be of greatest value for diagnostic purposes. We had several positive results after the three month stage, although they were all of the amber color rather than black. And as more work is done we may be able to differentiate more definitely between the pregnancies, inflammations and tumors, by the character of the positive reactions.

In the series of tests there were three proven pregnancies over three months giving a positive reaction, and one about four months. There were six tests on patients between four days and forty-five days over the regular menstrual period that were positive. From a bimanual examination we were not able to make a diagnosis of pregnancy with any degree of certainty. All of these in the latter group have since developed the usual symptoms and signs of normal pregnancy.

Although the number of cases here reported is too small to draw definite conclusions or to give percentage, yet the findings agree so nearly with the findings of other men working along the same line, we feel that certain conclusions may be drawn. Seemingly healthy non-pregnant women give negative results with this test. Women pregnant less than twelve weeks and probably sixteen weeks, will as a rule give positive results with the test.

The work so far done is sufficiently positive to be of aid in early diagnosis and to encourage further study.

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The Journal
OF THE
Michigan State Medical Society
ISSUED MONTHLY UNDER THE DIRECTION OF THE COUNCIL

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Grand Rapids, Mich.

Entered at Grand Rapids, Michigan, Postoffice as second class matter.
Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 26, 1918.

All communications relative to exchanges, books for review, manuscripts, news, advertising, and subscriptions are to be addressed to F. C. Warnshuis, M. D., 4th Floor Powers Theater Building, Grand Rapids, Mich.
The Society does not hold itself responsible for opinions expressed in original papers, discussions, communications, or advertisements.

Subscription Price—$5 per year, in advance

MAY 1, 1924

Report Malpractice Threats Immediately to Doctor F. B. Tibbals, 1212 Kresge Building, Detroit, Mich.

Editorials

IODIZED SALT IN THE PREVENTION OF SIMPLE ENDEMIC GOITRE

Now that through the whole-hearted cooperation of the salt producers of Michigan and with the medical profession of Michigan iodized salt for cooking and table use is on the market, it may be well to say a few words about what accomplishment may be hoped for from its general use.

There are limitations to all things. Particularly is this true of all things medical. No one with sound judgment as an inherent quality, after examining the facts that are easily obtainable concerning smallpox vaccination, would doubt its beneficial effects. Still smallpox has not been banished from the United States, one of the most enlightened of nations. Nor would such an individual be long in coming to the conclusion that vaccination for typhoid fever is a great boon to the citizen and a great economy to the state. Still typhoid fever continues to show itself in our highly developed centers of population. Such will doubtless be the result in the prevention treatment of goitre. There will be those who will oppose taking the amount of iodine the creator hoped to provide for them. There will be those who will not learn about iodized salt or who, because of some superstition, will not listen to their grocer or physician when he tells them about the beneficial effects of iodized salt. Nor should we expect that simple endemic goitre would become unknown should every person in the state use iodized salt. We are all aware of the fact that simple goitre occurs in some individuals who live or have lived all their lives in non-goiterous regions. It is not necessary to go into an explanation of why such people develop goitre. Suffice it to say that they do. Furthermore, those of us who have been interested in preventing goitre in children by systematic administration of iodine, have seen some goitres develop in spite of it, but very few.

We may easily hope that within a comparatively short time all people in the state will receive iodized salt and through it the ingredient in the food that is lacking in Michigan. The people will probably ultimately demand that all salt manufactured or sold within the state shall contain the proper amount of iodine and thus legislation will be easily accomplished.

Our Committee was strongly of the opinion in the early days of its work that legislation was the way to introduce iodized salt. However, as its work progressed and as it learned more about matters of this kind, the more convinced it became that legislation was not the way to do it now. It was convinced that its work would progress faster by first creating a demand for an iodized salt.

As this article goes to press all physicians in the state who read have an opportunity to know that the Advisory Committee of the Pediatrirc Section of the Michigan State Medical Society has succeeded in getting the hearty co-operation of the salt men from the standpoint of their rendering a public service to the citizens of the state. All wholesale grocers in the state know about iodized salt and are now able to supply the trade demand and within a very short time practically every grocer in the state, including those in the remotest parts, will receive the message from the advisory Committee and the salt manufacturers, enlisting their co-operation in getting their customers to use the salt.

The amount of iodine in the salt:—It is

the belief of the Committee, after quite a careful consideration of the problem, that salt containing .01 per cent sodium or potassium iodide will carry sufficient iodine to be effective. This amount was based upon the per capita consumption of the ordinary family. We found, quite uniformly, that this amounted to approximately four pounds per person per year. It had been demonstrated that as small an amount as 3 milligrams a week was sufficient to prevent goitre in school children and that as great an amount as 10 milligrams a week produced no effects. We soon encountered a difference of opinion on the per capita consumption of salt. Some salt manufacturers had roughly estimated the amount as five pounds per person per year.

Accordingly, families utilizing four pounds per capita of the .01 per cent iodized salt, would receive 3.43 milligrams per week. Those utilizing eight pounds per capita per year would receive 6.86 milligrams per week or approximately one milligram a day.

After securing the approval of the council of the State Medical Society, the Committee furnished all the salt producers, with whom they had been working, a certificate which approved of this amount of salt. At a conference with Dr. R. M. Olin of the State Department of Health and a delegation of the council of the Michigan State Medical Society, held in Dr. Olin's office at Lansing, Michigan, March, 1924, because of a wish on the part of the State Department of Health for a .02 per cent iodized salt and because our investigations had shown this amount of iodine would not impart a taste to the salt when added to the food in the cooking, or have a deleterious effect in the use of salt for commercial purposes, it was agreed to approve a sodium or potassium iodide content of from .01 per cent to .02 per cent in salt used for cooking and the table. This information was transmitted to the salt men at the earliest time.

The Michigan salt producers are entitled to much credit and praise for the splendid way in which they have taken up this work, making it possible, because of their equipment and advertising organizations for every one to receive the amount of iodine demanded by the tissues of the body at a cost within the reach of the poorest citizen in the state. This certainly is no small contribution. Without men of such spirit it could not have been accomplished. The Advisory Committee wishes to take this opportunity to express to them its sincere appreciation.

Survey:—The use of iodized salt will doubtless accomplish much. With careful surveys such as those already completed by the State Department of Health no definite information of any magnitude concerning the real effort to encourage an extension of these surveys will be made by all those interested in the problem and that subsequent re-surveys will be given the same enthusiastic co-operation accorded by the professioin thus tar.

IMPETIGO

Impetigo is rather a common infection among children. It is particularly prevalent in summer months, and the spring and fall school days. It is a distressing and embarrassing infection and causes much concern on the part of parents. As a rule it responds readily to treatment and can be eradicated in a week or ten days. However, quite frequently a physician encounters a very stubborn case that fails to respond to treatment. It is regarding these stubborn cases that this comment is concerned. The simple case customarily responds to the application of an ointment of ammoniated mercury or the red oxidi of mercury, but there are cases which appear uninfluenced by these ointments.

The reason is pointed out by Doctors Smith and Burky in the Johns Hopkins Hospital Bulletin. In an investigation they ascertained that persistancy of the infection was caused by a mixed infection of streptococci and staphylococci. When only a streptococci infection was encountered the condition cleared up promptly with the use of a mercury ointment. However, with a mixed staphylococci infection the condition persisted and did not respond to mercury treatment. On investigation it was found that the staphylococci were uninfluenced by mercury.

Search was then made for an effective remedial agent and argyrol, silver nitrate, zinc sulphate and yellow iodide of mercury were of no value. Gentian violet was then used and in it the authors state that we have a very potent remedy that will clear up the infection promptly and completely.

Gentian violet was used in a 5 per cent solution in 20 per cent alcohol. The stain is painted on after opening the vesicles and removing old scabs. After painting with the violet stain the area is covered with vaseline or boric ointment. Recovery ensued in from three to five days.

This use of gentian violet will be of desirable value in your treatment of these stubborn cases of impetigo.

THE KALAMAZOO CONFERENCE

The program that was outlined for a Spring Conference of the Council, Scientific Committee, Joint Committee on Public Education and County Secretaries, was held in Kalamazoo on April 16th. There was a splendid attendance and in every detail the discussions gave rich promises of a united, state-wide organizational activity.

It was determined that our Annual Meeting dates would be September 9, 10 and 11. The place being Mount Clemens as designated by the House of Delegates. Section officers will provide section programs for two section meetings. On the afternoon of the last day in place of separate section meetings, all the sections will unite into one general scientific meeting. Drs. Culver, Vandenburg and Sladen are charged with the responsibility of providing the speakers for that general meeting.

On the first evening there will also be a general meeting for the discussion of medical economic problems and for which some nationally known speaker will be invited.

This plan promises to provide a splendid, attractive and interesting program for our annual meeting and one which will arouse wide interest. Further details will be imparted in subsequent issues. Just now, mark the dates—September 9, 10 and 11.

The Secretaries Conference was attended by twenty-one secretaries and six members of the Council. A complete stenographic report of the papers and discussions will appear in the June issue. The County Secretaries Association was re-organized and Dr. F. C. Kinsey of Kent was elected President and Dr. G. J. Curry of Genessee was elected Secretary.

In the evening, those attending the conference and the members of the Kalamazoo Academy attended a dinner. There were some 175 doctors present. After the dinner Dr. Morris Fishbein, Associate Editor of the Journal of American Medical Association spoke on "Mirrors of Medicine." Dr. Abt, Chicago, Professor of Pediatrics, Northwestern University, read a splendid paper on "Collapse in Infants."

MIRRORS OF MEDICINE

This was the title of the offering that was presented at the Kalamazoo Conference by Dr. M. Fishbein, Associate Editor of the Journal of the American Medical Association. During its presentation we were very much concerned that a large number of the audience would bring onto themselves a rupture of their cerebral vessels from convulsive laughter that was provoked by the humor of the speaker.

Dr. Fishbein's portrayal of the old-time doctor, the specialist, surgeon, roentgenologist, urologist, obstetrician, gynecologist, neurologist and a few more prototypes of our modern medical subdivision representatives was resplendent with humor, pathos, sarcasm, criticism, and honor and realistically portrayed their foibles and fancies, their eccentricities and grandeurs, their merits and demerits. All readily perceived from his word pictures friends and enemies of present and past acquaintanceship.

It was humorous, and was so intended, yet it contained much for thought. Would that more of our representative men would unbend and give to us similar contributions. There is room and need for more humor in our mingling. There is and can be only one Fishbein, but others might emulate him as far as possible, for it is good to see ourselves from the ludicrous angle we often assume in our public and professional posing.

Necessarily for presentation at a meeting the offering was curtailed in length. We would all welcome it in book form with additions that are pertinent. From Dr. Fishbein's pen it would then equal "Mirrors of Downey Street" and "Mirrors of Washington."

THE TRAINED NURSE

In a recent issue of a well known nursing journal we read an article that contained this striking statement: "The nurse is no longer the servant of the doctor. Her's is a distinct profession." Think it over.

To the observer there will be apparent that there is a movement gaining headway that seeks to place the nurse before the public in the light of a distinct entity and endows her with super knowledge, ability and prestige. That movement seeks to sever the inter-dependence of doctor and nurse and purposes to create for the members of the nursing profession an independent place in our hospitals, clinics and sick chambers.

It is time that we were beginning to think straight on the subject. It is time that a halt be called on the "heroics," "sob-stuff," "martyrdom" and sentiment that has been injected in the arguments advanced by the proponents of the movement. We are therefore glad to be able to publish in this issue an article by Dean Cabot on the Interdependence of Medicine and Nursing. We

want you to read this article. We want you to think and we urge that you take up the problem in your own hospital and training school. There is a solution and that solution must be attained without creating an open rupture between doctors and nurses. The solution also must be made to conform to the requirements of medical men.

One thing is certain that if nurses continue to stress the importance of limited hours of duty at so much per "union hour day," they cannot hope to dignify their work with the term profession. They then retrograde themselves into a "trade" and surrender their purpose of service. Service cannot be limited by "hours at so much per" and retain its claim of unselfish service for the aid of suffering man.

Editorial Comments

The following, extracted from the Harper Hospital Bulletin, should characterize the basis upon which charity service is rendered. Sentiment alone, a quest for numbers and acceptance of cases regardless of their financial status, should be strenuously discountenanced:

It is of vital importance to know the economic status of those to whom this vast amount of service was rendered. No question is asked concerning the individuals who are beneficiaries of relief and social agencies, such as Mothers' Pension, Children's Aid Society, Juvenile Court, etc., to which class about one-third of our patients belong. It is concerning those who are wage earners that we must answer many legitimate questions. What is the standard by which the admission officer passes on applicants for admission? Or in other words, what guide is used by the admission officer to determine whether an applicant's income allows for medical care through the services of a private physician or permits of his eligibility for admission to the clinic? What amount is necessary in Detroit to cover the basic necessities of food, clothing and shelter? What is the average wage earned in Detroit? There is issued quarterly by the Detroit Visiting Housekeepers' Association, a minimum budget which is recognized by all agencies of the city. This budget is used by the admission officer as a gauge for admission. The budget issued December 1923, for the first quarter of 1924 is as follows:

MINIMUM FAMILY BUDGET (*per month*)

	Man and Woman	Man, Woman, Child 3	Man, Woman, Girl 15 Boy 3	Man, Woman, Girl 12, Girl 5, Boy 3
Food	$24.60	$29.69	$35.21	$42.23
Clothing	16.35	20.27	24.74	29.09
Rent	25.50	25.50	36.00	45.00
Household Furnishings	6.24	7.17	8.10	9.02
Fuel and Light	10.05	10.05	12.19	12.94
Extras	5.00	5.67	6.34	7.01
Total	$87.74	$98.35	$122.58	$145.29

Taking our most representative industry in Detroit, namely the automobile industry, to obtain a figure of the average wage, the U. S. Bureau of Labor Survey states: "The average Michigan automobile auto worker, excluding executive employees, clerks and power house men, receives within a few cents of $6 a day for a 50 and 2-10ths hour week. The exact figure is $35.49 a week, obtained by dividing the total amount of wages paid by the total number of employees.

Corresponding figures in tire industry are $36.68 a week.

The average number of days worked is 283.

The budget figures, of course, are based on a year's continuous income. In considering the family income the admission officer must recognize that while some incomes are far above the minimum budget, they may have been greatly reduced during the year by sickness, death, or unemployment, making clinic attendance necessary.

For a detailed study of the incomes of those admitted to the clinic the following tabulated chart for the month of June, 1923, as representative of any month, is offered.

322 new cases during June, 1923.
155 of these were referred in by social agencies.
167 cases from wage earning class (79 of these listed as unemployed).

MEMBERS OF FAMILY GROUP (DEPENDENT ON ONE WAGE EARNER)

Amount of Weekly Income	Man and Wife—No Children	Number of Dependent Children—17 years and under							
		1	2	3	4	5	6	7	8
Unemployed	13	10	6	7	5	1	0	0	0
$20 per week or less*	4	8	2	2	0	0	0	0	0
$24 per week or less*	4	6	6	2	2	0	1	1	0
$28 per week or less*	7	7	5	4	3	2	0	0	0
$32 per week or less*	3	8	7	4	5	1	1	0	1
$36 per week or less*	0	1†	6	9	4	1	1	3	1
$40 per week or less*	1§	1†	4‡	0	1	1	1	0	0
$40 per week or more	0	0	0	0	0	0	0	1	0

*Or less means between the amount starred and the preceding amouunt.
§Previously unemployed 6 months.
†Both cases from Probate Court.
‡Families heavily in debt due to illness in families.

SINGLE INDEPENDENT INDIVIDUALS

Amount of Weekly Income	Men	Women
Unemployed	34	13
$10 per week or less*	0	12
$14 per week or less*	0	6
$18 per week or less*	1	5
$22 per week or less*	2	3
$26 per week or less*	0	0
$30 per week or less*	0	0

*Or less means between the amount starred and the preceding amount.

In the hurry of our present day lives, the demands of each day and week are so exacting that little time remains for reflection or consideration of the future. We automatically drop into the habit of simply concerning ourselves with the present and resignedly adopt an attitude of letting the future take care of itself. We give little thought as to where our present practices will land, we give scant heed as to what present policies will establish as fixed principles a few years hence and we are negligently content to let those who are to follow us, meet and solve the problems of tomorrow. That is the indictment that may be written against us doctors today. Especially is that true in regard to our hospital, dispensary and clinic practices of today. We are fostering dependency and discouraging independency of the individual.

Strong people build strong nations. Weak people tear down nations. This country was not founded by individuals who were the beneficiaries of pensions and whose children were born under paternalistic governmental care. This nation was not established by men and women who did not exert themselves to provide for their personal wants and needs. They were not sought out by social workers who herded them in groups into clinics or who provided them with mothers' pensions and inspired them to lessen their personal efforts and if physical ailments overtook them, placed them in hospitals and clinics without fee.

Charity we must do and always expect to do. But charity that condones or inspires dependency and squelches individuual responsibilities is bound to eventually lead us into trouble. England now has over a million people who receive and live on their government doles. Do we want that in America?

Collier's Weekly has just completed a series of three articles on Diploma Mills and Fake Doctors. They are full of instruction to the public and desirable educational articles. We are appreciative of this assistance in presenting to the people the truth regarding medical education and scientific medicine. We commend Collier's Weekly to our members.

Joseph J. Devney, in a copyrighted article which we are taking the liberty of copying, has accumulated from 1,000 bankers and life insurance men this data on over 20,000 individuals and realistically sets forth what happens to the average doctor financially. We are eager to have our members become familiar with his conclusions:

The practice of medicine is distinguished by several commendable characteristics. It is one of the oldest professions, it is essentially humanitarian, its standard of ethics is high and its members persist in it with remarkable unanimity.

This latter fact makes a record of their financial rise and fall unusually interesting and instructive.

On the average, doctors in their twenties are worth comparatively little. As they are just getting started, and in many cases have to repay the expense of their education, they have little opportunity to accumulate.

Their rise from twenty-five to thirty-five is rather gradual. This does not mean that the average doctor is not considerably more prosperous in his thirties than in his twenties, but that he does not accumulate a great deal more. One outstanding reason for this is that it is policy for doctors to maintain a good standard of living. This requires the expenditure of a considerable portion of their income during the early years of their practice.

PROSPERITY PEAK

During his forties, the average doctor accumulates rapidly and reaches the peak of his prosperity.

Of all the large groups of professional and business men, the doctor reaches his prosperity peak earliest, hence his financial decline begins earliest. If he could only keep up the pace in his fifties that he has in his forties, he would become a financial giant. But there are forces which militate against this.

THE DECLINE

The decline after the peak has been reached is rapid until fifty-five; from then it is rather gradual, showing that the average doctor is about set financially, beginning with his sixties.

The reason the average man goes down financially in his later years is because more are slipping back than going ahead.

Probably the main reason for the doctor's early decline is the nature of his work. During his early professional life he leads a strenuous existence. Broken rests, long vigils, nervous strains and irregular meals make him slow up sooner than men in other professions.

Furthermore, medicine is a progressive science and after a doctor has been out of college twenty-five years, *unless unuusually studious,* he is not so well equipped with modern methods as the more recent entrants into the profession, and is likely to be supplanted by them in many cases.

Practice increases his skill, but the average doctor probably develops more from his early practice than from his later experiences. The older men become in all lines the more set they are in their ways of doing things and the less apt they are to adopt innovations.

When the doctor begins to make money fast, the tendency to increase his standard of living is accentuated. Then when he begins to slow up physically this eats into his accumulations as he is reluctant about lowering his standard. Unlike a manufacturer or a merchant, he cannot build up an organization which, with his direction, can make money for him and thereby offset his impaired earning power.

Another thing, since the professional man marries later than the average, his family expenses are greatest during his fifties, when his children are in high school or college, or both.

THE MALE CLIMATERIC

A careful compilation of reports on thousands of men engaged in various occupations appears to verify the theory that men experience a change of life which in many instances lessens their efficiency temporarily. Since the doctor must be mentally and physically fit to keep his practice up to the standard, a letting up for a period of from eighteen months to three years, or longer, as some physicians claim to be the time for the change to take place, is likely to show a decrease in his practice, hence in his income.

Judging from the economic results in many occupations, this change occurs most frequently in the late forties. This would reflect the result in the doctor's assets in his fifties, for when a doctor slips, he does not "come back" as easily as a business man. If people lose confidence in him, they will be slow to patronize him again. It is somewhat like starting over.

Another telling factor in a doctor's financial decline is bad investments. This is no reflection on his ability. It results from the nature of his occupation. As he does not need capital in his work, as business men do, he frequently invests in other people's enterprises. And too often "the other fellow" does not make good.

There are many safe business enterprises. But those which are safe today may be shaky tomorrow. Therefore, they must be watched. And the doctor who is a professional man first, and makes a success as such, has little time for outside business cares and investigations.

A FINANCIAL PROGRAM

Since it is a demonstrable fact that the average doctor makes many times as much from his practice as he does from his investments, a profitable policy for him to pursue is to deposit a good share of his annual surplus where it will require no attention on his part, yet be safe and yield a profit.

An ideal medium is life insurance. By taking a substantial block of it, he creates an immediate estate or income for his family, he provides for his own old age and leaves himself free from business cares and worries. By devoting his working time to the practice of his profession and his spare time to study and recreation, he will lead a more profitable and satisfactory life.

DOCTORS' WIDOWS

Another evidence of the advisability of doctors following some such program is the fact that *more than half the widows of doctors are either dependent or working from necessity.*

State News Notes

Born, a son, to Dr. and Mrs. E. C. Baumgarten, Detroit.

Dr. F. C. Warnshuis, Grand Rapids, will address the Missouri State Medical Society at its Annual Meeting in Springfield, Mo., on May 7th.

Dr. R. J. Hutchinson, Grand Rapids, spent ten days in April at his camp in Northern Canada.

Walker Brown, an unlicensed drugless practitioner of Stanton, Michigan, was convicted in the Circuit Court of a violation of the Michigan Medical Practice Act, and sentenced to serve a term of imprisonment in the county jail of four months, with a fine of $100. If the fine is not paid within this time, then the term of imprisonment is to be continued, not to exceed six months in all. Dr. Beverly D. Harison, Secretary of the Michigan State Board of Registration, was called as a witness in this case.

J. F. A. DeJordy, an unlicensed chiropractor of Boyne City, Michigan, was found guilty of violating the Michigan Medical Practice Act and sentenced to sixty days in the county jail, with $100 fine and costs in the amount of $100; in default of payment of such fine and costs, he is to remain in the county jail an additional four months, or until such fine and costs are paid.

This was the second case brought against DeJordy, the first resulting in a verdict of not guilty, although the judge had instructed the jury to convict.

The following officers were elected at the spring meeting of the Michigan Trudeau Society: Presiddent, Dr. J. W. Toan, Howell; Vice-President, Dr. W. H. Marshall, Flint; Secretary-Treasurer, Dr. William Vis, Grand Rapids.

The American Medical Association's Annual Meeting will be held in Chicago the week of June 9th. If you have not made your hotel reservations we urge that you do so at once.

Dr. F. B. Tibbals, Detroit, was unable to address the County Secretaries' Conference because of illness. Dr. Tibbals is willing to accept invitations from County Societies, insofar as possible, and speak on Medical Defense.

County Society News

JACKSON COUNTY

The annual meeting of the Jackson County Medical Society was held at the Foote Memorial Hospital, Dec. 13, at which time the following officers were elected:

President, Tohmas E. Hackett, M. D., Jackson; Vice President, R. M. Cooley, M. D., Jackson; Secretary, Don F. Kudner, M. D., Jackson; Treasurer, L. J. Harris, M. D., Jackson.

This meeting was followed by a dinner dance at the Jackson City Club. Mr. E. R. Young was the principal speaker on an excellent program.

The January meeting was an informal one, held at the Hayes Wheel Club at Round lake. There was no program as the meeting was purely social.

On Feb. 16th Dr. A. J. Ochsner of Chicago was the guest of the society and gave a splendid paper on "Osteomyelitis." Many visiting physicians from the surrounding counties were present.

The March meeting was held at Mercy Hospital and the subject of the evening was, "Diseases of the Thyroid Gland." Dr. Deacon of the State Board of Health told of the results of the goitre survey in Michigan. Dr. Frederick Coller, Assistant Professor of Surgery at the University of Michigan, talked on the "Surgical Aspects of Thyroid Disease."

D. F. Kudner, Secretary.

HILLSDALE COUNTY

The regular quarterly meeting of the Hillsdale County Medical Society was held at the Mitchell Library on Tuesday evening, April 8th at 7:30 p. m. In the absence of the president, the vice-president, Dr. E. C. Bechtol, took the chair.

Minutes of the Annual Meeting were read and approved. Dr. Bechtol then introduced the speaker of the evening, Dr. Harry B. Knapp of the sanitarium, Battle Creek, who addressed the Society on the subject, "Orthopedic Surgery in General Practice."

Dr. Knapp took up the following topics in order:

1. Un-united Fractures.
2. Stiff Joints.
3. Haemophilia in Joint Disease.
4. Paralysis following Poliomyelitis and Similar Cases.
5. Sub-acute and Chronic Arthritis with Exudation, especially of the Hip.
6. Synovitis.
7. Chronic Regional Arthritis caused by Focal Infections.
8. Tuberculosis of Spine.
9. Spastic Paralysis.
10. Non-Tuberculous Osteo-Arthritis of the Hip Joint.
11. Dislocation of the Semilunar Cartilage of Knee.
12. Congenital Dislocations of the Hip Joint.
13. Scoliosis (non-tubercular).
14. Strained, weakened and flat feet, with causes and best treatment of such feet.

Dr. Knapp dwelt briefly, but as comprehensively and clearly as possible, on the causes, diagnosis and treatment of the foregoing and one or two other classes of cases which are most likely to arise in the work of the general practitioner. He pointed out some of the pitfalls into which the physician may readily fall if unfamiliar with such cases, and how best to avoid them.

Dr. Ball of Reading, presented a case of scoliosis of spine with malnutrition and deficient development in a child of 18 months; also a case of diseased hip joint which could not be diagnosed without the X-ray.

In the absence of the gentlemen assigned to discuss the address, an informal discussion was held. Dr. Knapp was given a rising vote of thanks for his most valuable and interesting address, which, unfortunately, was heard by so few.

There were present at this meeting the following physicians, members of the Society:

Dr. Green, Dr. Sawyer, Dr. Miller, Dr. Frankhouser, Hillsdale; Dr. Yeagley, Br. Barnes, Waldron; Dr. McGFarland, N. Adams; Dr. Bell, Dr. Fenton, Reading; Dr. Oliver, Camden; Dr. Bechtol, Montgomery.

It is certainly to be regretted that so able and timely a lecture should have been heard by so few. The subject covered by Dr. Knapp is one of constant and anxious interest to every general practitioner and one not well covered in the text books.

The committee on Legislation and Law Enforcement reported that the chiropractor doing business without a license at Reading will be indicted within a day or two.

The Society then adjourned.

D. W. Fenton, Sec'y-Treas.